THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

Published every Thursday Morning by David Williams Co., 232-238 William St., New York.

Vol. 73: No. 13. *New York, Thursday, March 31, 1904.* $5.00 a Year, including Postage. Single Copies, 15 Cents.

Library of Congress Copyright Office 18 Jul 1904-d

Reading Matter Contents.....page 45
Alphabetical Index to Advertisers " 163
Classified List of Advertisers.... " 155
Advertising and Subscription Rates " 162

IRON AND STEEL PRODUCTS
REPUBLIC IRON & STEEL COMPANY
CHICAGO, ILL.

THE BRISTOL COMPANY,
Waterbury, Conn.
Bristol's Recording Instruments.
For Pressure Temperature and Electricity.
Silver Medal, Paris Exposition.
All Ranges, Low Prices, and Guaranteed. Send for Circulars.

SAMSON SPOT CORD

Also Linen and Italian Hemp Sash Cord.
SAMSON CORDAGE WORKS, Boston, Mass.

TURNBUCKLES.

Branch Office, 11 Broadway, New York.
Cleveland City Forge and Iron Co., - Cleveland, O.

TURNBUCKLES.

MERRILL BROS.,
465 to 471 Kent Ave.
Brooklyn, E.D., N.Y.

Mill Cinder.

PILLING & CRANE, Girard Building, Phila. Farmers' Bank, Pittsburg Empire Bldg., New York Board of Trade, Boston.

See on Page 24
the scope of sizes of
Large Tinned Sheets
Manufactured by
American Sheet and Tin Plate Co.

LIBRARY OF CONGRESS APR 1 1904 PERIODICAL DIV.

U.M.C. NEW PRODUCTS.

The .32 Automatic Colt Pistol Cartridge is loaded with a special high power smokeless powder, giving high velocity and operating freely through the mechanism of the Automatic Colt Pistol (pocket model). Those with the soft point bullet will be found desirable for sporting purposes, and those with metal case for military and target use.

RIM FIRE CARTRIDGES.

The U. M. C. .22 automatic rifle (Winchester model 1903) cartridge is now ready for the market. New .22 short ungreased, .22 long ungreased, and .22 Winchester inside lubricated are inexpensive rim fire cartridges loaded with the best grade of smokeless powder. Boys are calling for these cartridges as they can be carried loose in the pocket without the old inconvenience of the greased cartridge. They will not lead the gun.

U. M. C. Ammunition shoots well in any gun.

THE UNION METALLIC CARTRIDGE CO.
BRIDGEPORT, CONN.
Agency: 313-15 Broadway, New York City. Depot: 86-88 First St., San Francisco, Cal.

CAHALL BOILERS See Page 112.

PLATE PATTERN.

Capewell Horse Nails

CORRUGATED PATTERN

	Branches:	
NEW YORK,		PORTLAND, ORE.,
PHILADELPHIA,		BUFFALO,
CHICAGO,	DETROIT,	BALTIMORE,
ST. LOUIS,	CINCINNATI,	NEW ORLEANS,
BOSTON,	SAN FRANCISCO,	DENVER.

THE CAPEWELL HORSE NAIL CO., Hartford, Conn.

Jenkins '96 Packing

NONE BETTER, as it makes joint instantly and will last as long as the metals which hold it.
NONE CHEAPER, as it weighs less than many others sold at equal price per pound.
Remember, all genuine stamped with Trade-Mark.

JENKINS BROS., New York, Boston, Philadelphia, Chicago, London.

"Swedoh" Cold Rolled Steel is unexcelled for **Drawing** and **Stamping**
THE AMERICAN TUBE & STAMPING COMPANY
(Water and Rail Delivery) BRIDGEPORT, CONN. SEE PAGE 26.

MAGNOLIA METAL.
Best Anti-Friction Metal for all Machinery Bearings.

Fac-Simile of Bar. Beware of Imitations.

MAGNOLIA METAL CO.,
Owners and Sole Manufacturers, Chicago, Fisher Bldg. 113-115 Bank Street, NEW YORK. San Francisco, New Orleans, Montreal, Boston, Pittsburg and Philadelphia. We manufacture all grades of Babbitt Metals at competitive prices.

THE
ANSONIA BRASS AND COPPER CO.
MANUFACTURERS OF
BRASS AND COPPER
Seamless Tubes, Sheets, Rods and Wire.

SOLE MANUFACTURERS
Tobin Bronze
(TRADE-MARK REGISTERED.)
Condenser Plates, Pump Linings, Round, Square and Hexagon Bars, for Pump Piston Rods and Bolt Forgings.
Seamless Tubes for Boilers and Condensers.
99 John Street, - - New York.

Randolph-Clowes Co.
Main Office and Mill,
WATERBURY, CONN.
MANUFACTURERS OF
SHEET BRASS & COPPER.
BRAZED BRASS & COPPER TUBES.
SEAMLESS BRASS & COPPER TUBES
TO 36 IN. DIAM.
New York Office, 253 Broadway, Postal Telegraph Building, Room 715.
Chicago Office, 602 Fisher Bldg.

BRASS { SHEET ROD WIRE
COPPER { SHEET ROD WIRE
GERMAN SILVER { SHEET ROD WIRE
LOW BRASS. SHEET BRONZE.
SEAMLESS BRASS AND COPPER TUBING. BRAZED BRASS AND BRONZE TUBING. : : : : : : : :

WATERBURY BRASS CO.,
WATERBURY, CONN.
130 Centre St., New York. Providence, R. I.

Bridgeport Deoxidized Bronze & Metal Co.,
BRIDGEPORT, CONN.
Automobile Castings a Specialty.
High Tensile Strength.
Bronze and Aluminum Alloys.
Write Us.

THE PLUME & ATWOOD MFG. CO.,
MANUFACTURERS OF
Sheet and Roll Brass
—AND—
WIRE
PRINTERS' BRASS, JEWELERS' METAL, GERMAN SILVER AND GILDING METAL, COPPER RIVETS AND BURRS.
Pins, Brass Butt Hinges, Jack Chain, Kerosene Burners, Lamps, Lamp Trimmings, &c.
29 MURRAY ST., NEW YORK.
144 HIGH ST., BOSTON.
199 LAKE ST., CHICAGO.
ROLLING MILL: THOMASTON, CONN. | FACTORIES: WATERBURY, CONN.

SCOVILL MFG. CO.,
Manufacturers of
BRASS, GERMAN SILVER
Sheets, Rolls, Wire
Rods, Bolts and Tubes,
Brass Shells, Cups, Hinges,
Buttons, Lamp Goods.
SPECIAL BRASS GOODS TO ORDER
Factories, WATERBURY, CONN.
DEPOTS:
NEW YORK, CHICAGO, BOSTON.

JOHN DAVOL & SONS,
AGENTS FOR
Brooklyn Brass & Copper Co.,
DEALERS IN
COPPER, TIN, SPELTER, LEAD, ANTIMONY.
100 John Street, - New York.

Matthiessen & Hegeler Zinc Co.,
LA SALLE, ILLINOIS.
SMELTERS OF SPELTER
AND MANUFACTURERS OF
SHEET ZINC AND SULPHURIC ACID.
Special Sizes of Zinc cut to order. Rolled Battery Plates.
Selected Plates for Etchers' and Lithographers' use.
Selected Sheets for Paper and Card Makers' use.
Stove and Washboard Blanks.
ZINCS FOR LECLANCHE BATTERY.

Arthur T. Rutter
SUCCESSOR TO
WILLIAM S. FEARING
256 Broadway, NEW YORK.
Small tubing in Brass, Copper, Steel, Aluminum, German Silver, &c. Sheet Brass, Copper and German Silver. Copper, Brass and German Silver Wire. Brazed and Seamless Brass and Copper Tube. Copper and Brass Rod.

BRASS FOUNDERS FINISHERS J. J. RYAN & CO.
6874 West Monroe St., Chicago.
Best Bronze, Babbitt Metals, Brass and Aluminum CASTINGS On Short Notice.

THE BRIDGEPORT BRASS CO.,
BRIDGEPORT, CONN.
19 Murray St., New York.
85-87 Pearl St., Boston.
17 N. 7th St., Philadelphia.
MANUFACTURERS OF
Brass AND Copper { SHEET TUBING WIRE.
Lamp Goods of all Kinds.
BRASS AND COPPER GOODS
In Great Varieties.

Brass, Bronze and Aluminum CASTINGS
FOUNDERS—FINISHERS.
W. G. ROWELL & CO., Bridgeport, Conn.

HENDRICKS BROTHERS
PROPRIETORS OF THE
Belleville Copper Rolling Mills,
MANUFACTURERS OF
Braziers' Bolt and Sheathing
COPPER,
COPPER WIRE AND RIVETS.
Importers and Dealers in
Ingot Copper, Block Tin, Spelter, Lead, Antimony, etc.
49 CLIFF ST., NEW YORK.

The Locomotive of To-Day. Reprinted with revisions and additions from the "Locomotive Magazine." Second edition. 8vo. Cloth. 200 pages, 37 illustrations. 16 half-tone plates. London, 1903.....$1.00
For sale by David Williams Co., 232 William St., N.Y.

THE IRON AGE

THURSDAY, MARCH 31, 1904.

Accurate Drill Jigs.

BY C. L. GOODRICH, HARTFORD, CONN.

Several very accurate drill jigs were recently made for a customer by the Pratt & Whitney Company, in which the limit of variation from specifications allowed between the centers of any two holes was 0.0001 inch. The following is an account of the elaborate preparations and the extremely careful work which were necessary to produce the jigs with the required precision:

One of the drill jig plates A is shown in Fig. 1. It is of gray cast iron, has a greatest length of 17 inches, a greatest hight of 9 inches and has 42 bushing holes. Several castings were made and annealed to free them from strain, and were then carefully planed on all working surfaces. From these one was selected, and all of the holes were carefully bored, approximately 0.01 inch smaller than the finished diameter and within 0.0005 to 0.0015 inch of correct position, by using part of the devices that were afterward used for the finish boring. The plate was then permitted to "season" for about two months, during which time the special finish boring tools were completed.

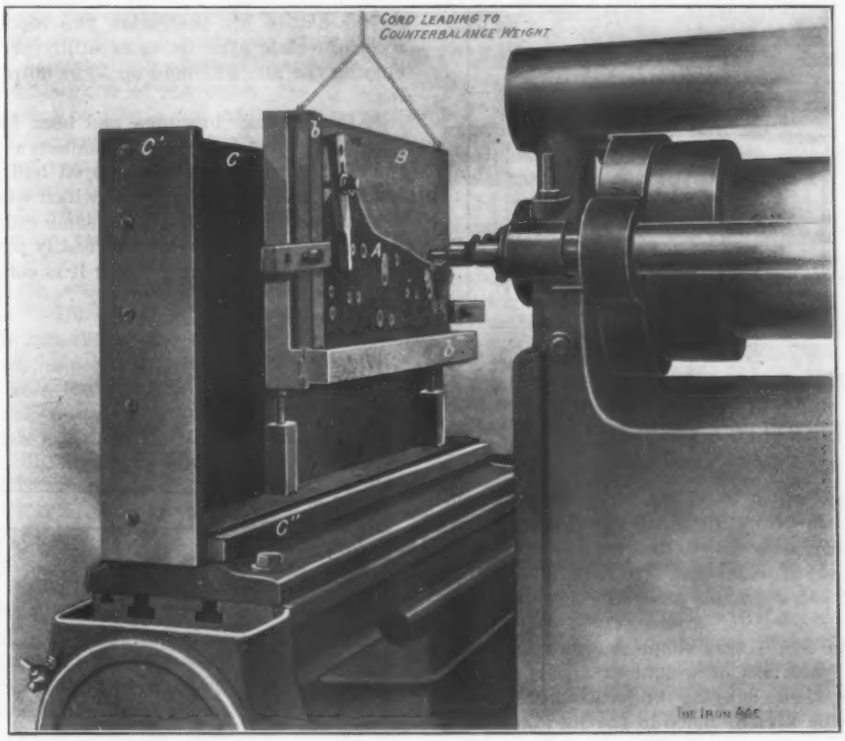


Fig. 1.—Showing Jig Plate and the Manner in Which it was Supported in the Milling Machine.

Before describing these special tools in detail it will be well to outline the methods used in finish boring. Referring to Figs. 1 and 2, A is a drill jig plate, B a movable subplate to which the plate to be bored was secured, and C is a large knee, on one face of which the subplate was clamped prior to each boring operation. This knee was rigidly bolted and doweled to the table of a universal milling machine. As only in and out movement in line with the spindle was necessary, the table was secured against accidental longitudinal movement, and the milling machine knee was clamped to prevent vertical displacement. D, Fig. 1, is an adjustable, inserted tooth, boring tool, fitted in the machine spindle. E is one of several steel locating plugs used in correctly positioning B, the subplate carrying the drill plate, in relation to the stationary knee C. Two varying lengths of locating plugs were required for each hole, to locate the subplate horizontally and vertically.

To insure accuracy the knee C and subplate B were carefully planed, annealed, the clamping holes drilled and tapped, and then "seasoned" before being finally scraped. Steel straight edges, c' and b', at right angles to c'' and b'' respectively, were next permanently fastened on C and B. Extreme care was necessary in making these steel strips, as it was between their surfaces that the locating plugs E were to be used for position testing. A master straight edge was made by the "three-strip" method—*i. e.*, making three parallel strips perfect by testing both sides of all three on one another until daylight was shut out between every combination, and the surfaces c', c'', b' and b'' were scraped and tested with it until perfect mirror surfaces resulted. To test the angles between the straight edges three perfect squares were made and tried as shown in Fig. 3 until their edges excluded the light when presented to one another in all possible combinations. The distances of the ledges on the straight edges from the face of the knee C, indicated by X and Y, Fig. 2, were corrected until they were exactly equal, so that the ledges might serve as guides in placing the locating plugs exactly parallel with the subplate and knee to avoid error. The final testing of the edges and angles was done after the parts had been clamped to the milling machine table.

Each morning before commencing work the relation of the knee C to the machine spindle was tested by two proving bars to be positive that it had not been altered. These were arranged to swing on a hardened arbor placed in the machine spindle, and before being used the spindle was first run for several minutes and then adjusted to register with a mark on the column.

Both ends of the plugs E, Fig. 2, were turned concentrically to the same diameter for a length slightly exceeding the diameter. The plugs were of steel, and were

roughed out 0.00025 inch too long, "seasoned" for four weeks, lapped down to an exact measurement and tested on a Pratt & Whitney standard measuring machine. As these machines will detect errors of 0.00005 to 0.000033 inch, the plugs were well within the limits permitted to the holes in the jig. The bar on the measuring machine is of standard length at 62 degrees F., at which temperature the plugs were tested and corrected, and the subsequent locating of the subplate in its various positions and all boring were done at the same temperature. The jigs were made in the winter when it was easy to keep the room at the required temperature by regulating the radiator valves and opening the windows. The machine was, of course, protected from drafts, and the plugs were handled with split rubber tubing, to insulate them from the heat of the hands. These refinements were necessary, owing to the varying lengths of plugs required (from 2 to 20 inches) and the difference in bulk of the different parts, for the expansion due to an increase of 2 degrees in temperature would have introduced an error not permissible. Extreme delicacy of touch was also required in handling the plugs to obtain uniform tension, and particular care not to crowd them between the steel strips.

It was surprising how distinctly a difference of less than 0.0001 inch could be detected with the locating plugs.

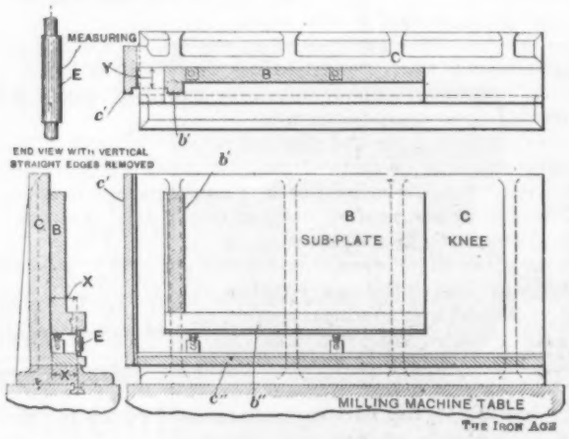


Fig. 2.—Detail of the Supporting Fixtures.

One 20 inches long, which could not be crowded perpendicularly between the straight edges without considerable pressure, was brought lightly to the position shown in Fig. 4. The distance H was about 1-16 inch, and the difference between I and J, in this case, was approximately 0.000033 inch.

As indicated in Fig. 1, the subplate was counterbalanced so that no variation of weight or strain was imposed on the knee when changing the location of the subplate for drilling the various holes in the jig plate. The suspending cord was kept vertical to prevent side tension, and the pulley over which it ran was placed so as to vibrate in unison with the milling machine and prevent pounding. Without these precautions, notwithstanding the care taken to have the carriage fit closely, a tipping action would probably have accompanied each shifting of the subplate, and very little would have caused errors as great as 0.0001 inch.

To raise the subplate, jacks, shown in Figs. 1 and 2, having 24 threads to the inch, were used. After the subplate was in approximately the correct position it was tested with the measuring plugs E. These plugs were never allowed to sustain weight, and were used twice in testing distances as far apart as possible, care being taken to remove any particles of dust that might lodge on the steel strips. After all the holes in the jig plate had been finish bored, hardened plugs with 0.0001 inch taper were pushed through them by hand to remove minute burrs and smooth the surface. It should not be inferred from this that the holes were left rough after the finish boring, as the in and out feed of the carriage was but 0.0005 inch per revolution of the spindle. Each drill bushing was ground inside and out at one holding to obtain perfect concentricity, and given a taper of about 0.0001 inch. To avoid straining the casting the bushings were not forced home until they could be put in by hand pressure to within one-sixteenth of the full depth. To one inexperienced in inserting a perfectly round bushing in a carefully bored hole without heavy pressure, it might seem doubtful that it is more difficult to remove a bushing put in in this manner than when it was driven in 0.001 to 0.002 too large. The fact is that bushings are often forced into holes that are not round or smooth, and are too small, so that the bushing acts like a punch and makes

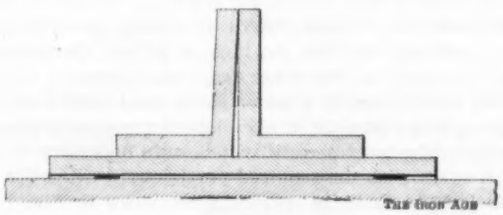


Fig. 3.—Method of Truing the Try Squares.

the hole even worse, resulting in a poor fit with contact at only a few points. Tool makers who handle cylindrical plug and gauge rings appreciate how easily they may become "stuck." This is due to atmospheric pressure, and also, in the writer's opinion, to molecular attraction. The writer has in his possession two blocks about 2 inches square, which, after being carefully pressed together, excluding the air, will hold up 50 or 60 pounds before parting.

After all the bushings had been inserted in the jig plate each hole was tested from seven others, and it was found that the methods employed had given the desired results. Two of the jig plates which were made had quite a number of holes having the same center distances, and it was found that plugs were readily put through the two plates in all such holes. When it is considered that these

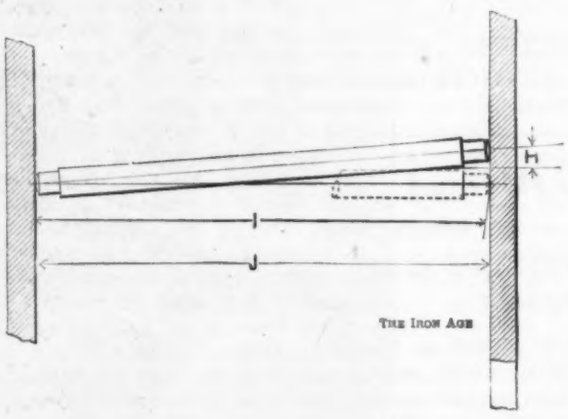


Fig. 4.—Indicating the Accuracy Possible with the Measuring Plugs.

were close fitting plugs, and that the plates were 1¾ inches apart, it will be conceded that the work must have been done with remarkable accuracy.

The air resistance of fly wheels has been investigated by Herr Scholter of Nurnberg. The experiments were made on the fly wheels of two horizontal tandem compound engines developing 450 horse-power at a speed of 95 revolutions per minute. The arms of each of the fly wheels are formed of a double T, with a central web set parallel to the center line of the shaft. The two faces were covered with a smooth protection of sheet metal. In order to determine the difference in the resistance under the two conditions, with and without the covering, one dynamo was made to serve as a motor to drive the unloaded engine. With the fly wheel in its original condition the work required was 13,300 watts, while, after the wheel was covered, only 9874 watts were needed. This shows a decrease of no less than 25 per cent. in the total friction of the engine.

The Total Sulphur and Different Forms of Sulphur in Pig and Cast Iron.

BY GEORGE T. DOUGHERTY, CHICAGO.

In *The Iron Age* of February 25, 1904, appeared a paper by S. S. Knight, on "A Rapid Method for Determination of Total Sulphur in Iron." The idea of supplanting by means of a porcelain crucible over a roaring flame from an "adjustable" Bunsen burner (usually sold for gasoline gas), the bulky combustion tube and furnace for annealing iron drillings previous to evolution by hydrochloric acid, was published nearly two years ago, as will be seen by referring to my article on "Notes on Iron Analysis," in *The Iron Age*, May 8, 1902.

The Knight modification of the process, while not quite so simple, is based on an equally correct principle and ought to do equally good work; though still better with 5 grams of drillings instead of only 2 grams which he uses, on the ground that any accidental or personal error in the operation will be of much less effect when divided by 5 than by 2.

Mr. Knight seems to be under the misapprehension that the original process by Walters and Miller took a whole hour to perform the necessary annealing, and that his own ten minutes' annealing therefore constitutes a notable improvement over this or any other process. The fact is that Walters and Miller annealed for 15 minutes only, with the general run of irons in the market, and 30 minutes for titaniferous pigs. I made the same claims for myself when I published my aforesaid paper, submitting results in corroboration of the same.

I may be permitted to offer a few additional remarks from my added experience with the annealing method during the past two years. I have successfully used in place of filter paper for a top layer, 1-5 to ½ gram of dried powdered charcoal, which is more compact and more slowly combustible. A small crucible, not much over 10 c. cm., is best suited for a thorough annealing of drillings over a Bunsen flame, which must be roaring, easily obtainable with the "adjustable" or combination type of burners. For the material of the crucible, thin iron, or steel, or nickel, or, best of all, platinum, is more desirable and less friable than porcelain, will heat up and throughout and cool down more quickly. The size and material of crucible are of rather less importance if one has a good hot muffle furnace in use.

The only variety of iron that does not always yield 100 per cent. of its total sulphur to evolution by my annealing, especially when carrying high sulphur, comes from New Jersey. S. T. Adams of Wharton Furnaces, in that State, on seeing my paper and results in *The Iron Age*, sent me quite a number of samples for checking by my method. This peculiar brand of pig had been entailing on him the unpleasant extra work of having to examine the insoluble residue after evolution for additional sulphur, and reporting the sums of evolved and residual sulphur. I herewith subjoin the results of sulphur determinations in those refractory irons before and after annealing:

Number.	Evolved.	Residual.	Evolved and residual.	Annealed and evolved.	Gravimetric complete oxidation.
948	0.057	0.070	0.127	0.122	0.128
949	0.018	0.061	0.079	0.080	0.079
951	0.035	0.050	0.085	0.082	0.090
2423	0.038	0.045	0.083	0.072	....
2424	0.078	0.039	0.117	0.103	....
2425	0.063	0.033	0.096	0.085	....
2349	0.068	0.057	0.125	0.120	....
Special No. 1	0.008	0.027	0.035	0.084	....
Average			0.093	0.087	

A study of the above figures reveals several surprising or unique features, which seem to be peculiar to this and perhaps some other brands of New Jersey pig, and which are believed to be due to the presence of titanium.

1. The sulphur in the insoluble residue frequently predominates over the evolved sulphur. In No. 949, the excess of residual over evolved sulphur equals 0.043 per cent.; and the ratio of residual to evolved sulphur in Nos. 949 and Special No. 1 is about 3.50 to 1.

2. The residual sulphur rises as high as 0.070 per cent. (No. 948), which is unusual or unheard of with our ordinary irons. This showing goes far beyond and makes exceedingly modest my statement of two years ago, putting the maximum shortage in sulphur by the direct evolution method in irons at the figure of 0.025 per cent., from my personal experience or knowledge up to that time.

3. All the deficiency of sulphur by the usual evolution method is found in the insoluble residue. It is almost universal with our ordinary irons that no sulphur, at least in notable quantity, is to be found in the insoluble residue; any "missing link" in the amounts of sulphur between direct evolution and gravimetric complete oxidation is charged to volatile organic sulphur.

Strong potassa (17 per cent.) in a Varrentrapp and Wills nitrogen bulb seems, in my hands, to arrest and fix sulphureted hydrogen from such irons more effectually than ammoniacal cadmium chloride contained in a tall 8-ounce beaker. For example, No. 2349 gives by KHO 0.120 per cent. of sulphur after annealing, and by Cd Cl only 0.105 per cent., even after standardizing with standard steel drillings by the respective absorbents which will require rather different factor figures in calculating.

I believe it will be conceded that I have good warrant for declaring that, like carbon, sulphur in iron exists in more than one form, namely:

1. Steel sulphur, evolved as H_2S by treatment with hydrochloric acid. I so call it because the sulphur in steel is invariably of this form.

2. Volatile organic sulphur, evolved in another form than as H_2S when treated with hydrochloric acid.

3. Residual sulphur left in the insoluble residue after treated with hydrochloric acid.

Volatile organic and residual sulphur scarcely ever coexist in the same mass of iron.

Reheating to redness or due annealing converts volatile organic and residual sulphur into "steel" sulphur.

It is a question whether all of the three forms of sulphur would affect equally, or not, the strength or weakness of iron; but when we recollect the fact that certain branches of iron castings, notably car wheels, require annealing before being put in service, it should be apparent that steel sulphur is the least injurious of the three. It has been ever known that sulphur, only less than carbon, is most influential part for part in its effect on the structure or physics of iron, one part of sulphur having been estimated to counter-affect or neutralize as much as 12 parts of silicon.

The New Rod Mill at Sydney, Nova Scotia.—At the Dominion Iron & Steel Company's works, Sydney, Nova Scotia, the installation of the small billet mill and the rod mill is approaching completion. The billets intended for the rod mill will be reduced to 1¾ inches square and cut, after passing through the last rolls, into lengths of 30 feet. A carrier deposits them on cars, which take them to a Morgan heating furnace, after which they are reduced to rods in a continuous mill. The machinery for this mill was designed and built by the Morgan Engineering Company, Worcester, Mass. Its erection has been in charge of H. E. Rice, who has been in Sydney for about a year. Its guaranteed capacity is 200 tons *per diem*, double turn.

The three 16,000-ton battle ships recently authorized by Congress are to have the following dimensions: Length between perpendiculars, 450 feet; length over all, 456 feet 4 inches; extreme breadth, 76 feet 8 inches; depth, 46 feet; draft of water, 24 feet 6 inches. The hull will be plated with ½-inch steel, with a double bottom. A cofferdam 7 feet high and 30 inches wide, filled with corn pith cellulose, and located back of the armor belt, protects the water line. The power equipment includes 12 water tube boilers, having a total heating surface of 46,750 square feet, and a grate surface of 1100 square feet; they will carry a pressure of 265 pounds to the square inch. Two triple expansion engines with four cylinders each will drive the vessel at a speed of 18 knots. The cylinders will be 32½, 53, 61 and 61 inches in diameter by 48-inch stroke. The total power of both engines, at 120 revolutions per minute, is 16,500 horse-power.

Tests of Motor Driven Roller Tables at Duquesne.

BY ALBERT KINGSBURY.

The tests described below were made with the collaboration of E. Friedlander, electrical superintendent at the Duquesne Steel Works of the Carnegie Steel Company. The object of the tests was to determine data for use in estimating the sizes of motors required in this class of service. The tests were made during the regular operation of the machinery; additional runs were made

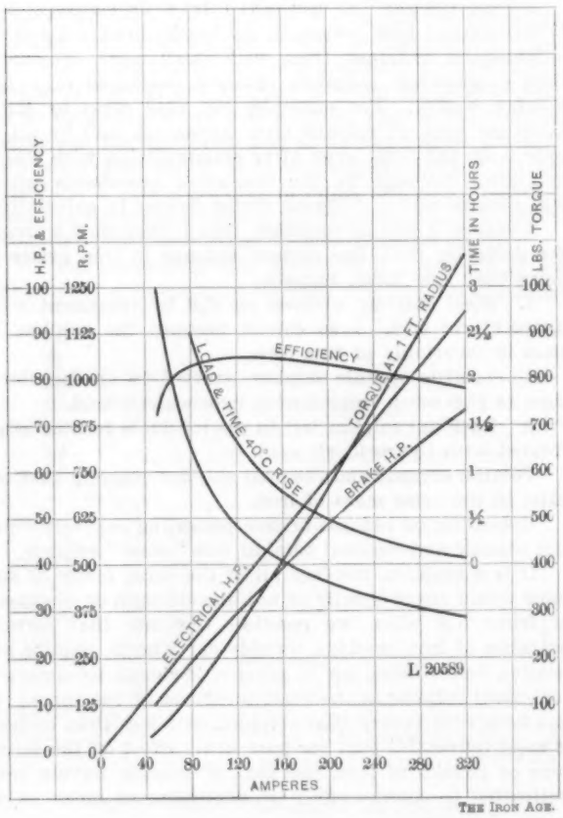


Fig. 1.—Characteristic Curves for Westinghouse Railway Type No. 38B Motor.

without loads on the rollers, for determining the no load friction.

The machines were in each case driven by a Westinghouse railway type No. 38 B motor, 220 volts, series wound, nominal rating 45 horse-power. The characteristic curves for this motor are shown in Fig. 1.

Test No. 1. Roller Table in 40-Inch Mill.

The general arrangement of the machinery is shown in the diagram, Fig. 2. The duty of the roller table is to handle the slabs, weighing from 5400 to 8100 pounds each, which come from the 40-inch mill. Sometimes the slabs are cut into billets about 4 feet long by the shears B; at other times the slabs are cropped at the ends by the shears, and then passed on to the 14-inch continuous mill. The latter was the service at the time of the test on November 27, the slabs being 4 x 6 inches and about 75 feet long, weighing 6000 pounds. The details of the service were generally as follows:

The rollers are started when the slab reaches the shears A, and stop when the slab comes to the proper position for cropping the leading end at B; after cropping this end the rollers carry the slab about 60 feet further through the shears B, the slab now being largely borne by rollers beyond the shears, driven by an independent motor. A stop is then made while the slab is turned on edge by hand; the slab is then carried ahead to the proper position for cropping the following end, and, finally, a short run is made to carry the crop end through the shears. The mode of operation varies considerably, sometimes additional throws of the controller being required to adjust for proper length of crop or for extra crops. The current is rarely reversed for braking. The rollers beyond the shears B sometimes aid the motor under test, sometimes the reverse; their effect on the whole could not be exactly determined, but appeared to be negligible.

Dimensions.

Length of roller table.....90 feet.
Diameter of rollers.....10 inches.
Length of rollers.....46 inches.
Bearings of rollers.....diameter, 5 inches; length, 10 inches.
Line shaft.....diameter, 5 inches; length, 87 feet 9 inches.
Slabs carried during test, O. H. steel, 4 x 6 inches, about 78 feet long.

Gears.

At motor.....14-68 teeth, 3 diametral pitch.
Intermediate.....18-22 teeth, 2.50-inch pitch.
Miter gears.....18 teeth, 2.50-inch pitch.

$$\text{Total gear reduction} = \frac{14 \times 18}{68 \times 22} = 0.1685 = \frac{1}{5.94}.$$

Weights (Computed).

Weights on Bearings of Rollers (5 Inches Diameter).

	Pounds.
13 rollers (solid)	15,024
2 rollers (solid) (short)	2,083
22 rollers (cored)	15,171
36 miter gears	4,725
3 spur gears for short rollers	204
Total (not including weight of slab)	37,207

Weights on Line Shaft Bearings (5 Inches Diameter).

	Pounds.
5-inch shaft, 87¾ feet long	6,002
5 couplings	2,158
36 miter gears	4,725
1 spur gear, 22-T	424
Total	13,309

Weights on Intermediate Shaft Bearings 4 Inches Diameter.

4-inch shaft, 49 inches long	175
1 spur gear, 18-T	285
1 spur gear, 68-T	170
Total	630
Total weight of moving parts (exclusive of slab)	51,146

Moments of Inertia (Computed).

Rollers and Line Shaft (Geared to the Same Speed).

13 rollers (solid)	37.18	pounds × feet² ÷	32.2
2 rollers (solid) (short)	4.92	"	"	"
22 rollers (cored)	49.50	"	"	"
5-inch shaft	4.04	"	"	"
5 couplings	19.80	"	"	"

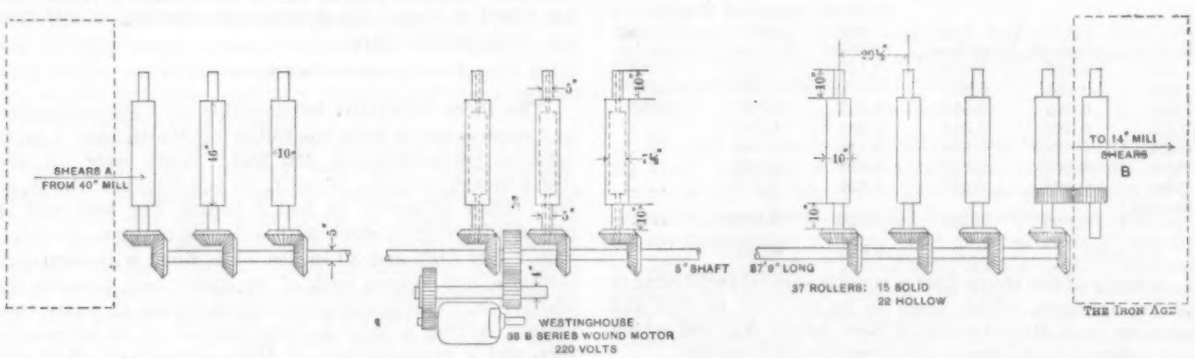


Fig. 2.—Plan of Roller Table for 40-Inch Mill.

72 miter gears	37.50	"	"	"
1 spur gear, 22-T	3.78	"	"	"
3 gears for short rollers	0.61	"	"	"
Total	157.33	"	"	"

Reduced to armature. $157.33 \times \left(\frac{14}{68} \times \frac{18}{22}\right)^2 = 4.48$.

Intermediate Shaft (Axle) and Gears.

4-inch shaft	0.07
1 gear, 18-T.	2.00
1 gear, 68-T.	3.05
Total	5.12

Reduced to armature, $5.12 \times \left(\frac{14}{68}\right)^2 = 0.218$.

Armature alone (from pendulum experiment)	2.21
Total moment of inertia, reduced to armature	4.480 0.218 2.210
	6.908

Percentage of total in armature alone, 2.21 ÷ 6.908 = 32 per cent.

Test for Machine Friction at Constant Speeds with No Load.

Motor speed. R.P.M. by tachometer.	Volts at brushes.	Amperes.	Motor torque. Pound feet (from curves).	Motor output. Horse-power (computed).
650-700	140	55	55	6.8-7.3
650	140	55	55	6.8
960	190-220	65-70	83-100	15.2-18.3

Analysis of Machine Friction Under No Load.

Assuming the coefficient of friction the same at all bearings, with the efficiency of the miter gears 94 per cent., the 18-22 spur gears 95 per cent. and the 14-68 spur gears 96 per cent., the coefficient f implies a torque at the motor given by

$$\frac{\frac{37{,}207 \times 2.5}{12 \times 0.94} + \frac{13{,}309 \times 2.5}{12} + \frac{630 \times 2}{12}}{\frac{0.95 \times 22}{0.96}} \times f = 2070\,f \text{ pound feet.}$$

At 650 to 700 R. P. M. of motor the torque is 55 pound feet,

whence $f = \frac{92}{2070} = 0.0266$.

At 960 R. P. M. the torque averages 92 pound feet,

whence $f = \frac{92}{2070} = 0.0445$.

Test in Service.

The service during this test consisted in handling open hearth steel slabs weighing 6000 pounds each, for cropping the ends, as already described. Record was kept of the number of slabs passed, and the length of each period of motion of the machine, the motor current and voltage, frame temperature and air temperature. A Thompson integrating wattmeter was used for measuring the field loss directly. The machine had been in continuous service for several hours preceding the test. The air temperature was taken at a point about 1 foot from the motor frame, on the colder side (away from the machine); the frame temperature by a thermometer packed against the outside of the frame with waste; after the run a thermometer was packed against one of the field coils with waste to obtain the field temperature, this not being practicable during the test.

Times Running of Rollers from Start to Stop by Stop Watch.

Time. p.m.	Slab No.	Time of run in seconds. Run No. 1	2	3	4	5	6	Total running time for slab.
2.30	1	19.0	1	1	2.0	10	3	36.0
	2	13.0	13	5	..	..	..	31.0
	3	15.5	14	6	2.0	..	..	37.5
	4	17.0	14	3	..	..	..	34.0
	5	19.0	2	14	3.5	..	..	38.5
	6	20.0	1	1	1.0	13	2	38.0
	7	14.0	1	1	1.0	15	4	36.0
	8	22.6	14	4	3.0	..	..	43.0
	9	20.0	1	1	15.0	4	..	41.0
	10	19.0	1	14	4.0	..	..	38.0
	11	19.0	1	14	4.0	3	..	41.0
	12	20.0	12	4	..	..	..	36.0
	13	19.0	13	4	3.0	..	..	39.0
3.03	14	14.0	12	6	3.0	..	..	35.0
	15	22.0	1	1	14.0	4	5	47.0
	16	15.0	2	1	11.0	3	..	32.0
	17	20.0	12	5	5.0	..	..	42.0
	18	21.0	12	3	..	..	..	36.0
	19	15.0	1	12	4.0	..	..	32.0
	20	18.0	1	14	3.0	3	..	39.0
3.19	21	19.0	1	14	3.0	..	..	37.0
	22	16.0	3	..	..	..	..	29.0
3.26	23	15.0	2	1	2.0	15	3	38.0

Total time of test, 3,240 seconds.
Total running time, 856 seconds.
Running time as fraction of total time, 0.264.

Ammeter Readings.

Throw on starting, mean of 37 readings (highest throw, 215; lowest, 150).....196.8 amperes.
Steady running with slab on rollers, mean of 31 readings (highest, 90; lowest, 73).....81.1 amperes.
Corresponding average motor torque.....132 pound feet.
Steady running without slab, mean of 28 readings (highest, 80; lowest, 68).....74.9 amperes.
Corresponding average motor torque.....112 pound feet.

Voltage at Brushes.

Steady running, mean of six readings (highest, 225; lowest, 210).....217 volts.

Motor Speeds by Tachometer.

Mean of four readings taken with slab on table, running steady .....878 R.P.M.
The tachometer was tested at 730 R.P.M. and found correct at that speed.

Readings of Temperature and of Field Loss Wattmeter.

Thompson integrating wattmeter No. 222,038, with special resistance coil marked 25 V. Air temperature near resistance coil, 0 degree C. approximately.

Time, p.m.	Wattmeter readings.	Air temperature, Centigrade, 1 foot from motor.	Motor frame temperature, Centigrade.
1.00	53,155	4.0	24.0
2.05	53,547.5	6.3	24.0
2.31	53,700	4.6	24.1
3.03	53,860	5.5	24.0
3.26	53,990	5.0	24.1

The record from 2.05 to 3.26 p.m. (81 minutes) is taken as covering most nearly the same period as the observations of the times of runs for each slab. Average revolution per minute of wattmeter disk 5.47. Temperature of motor field coils by thermometer at end of test, 33.5 degrees; rise above atmosphere, 28.1 degrees C.

Calibration of Field Loss Wattmeter.

Amperes.	Volts.	Revolutions of disk.	Time. Minutes.	Watts.	Watts per R.P.M.
200	8	53.5	1	1,600	29.9
150	6	30.4	1	900	29.6
100	4	25.0	2	400	32.0
75	3	20.7	3	225	32.6
50	2	8.7	5	100	51.5

The range of current during the test being from 68 to 215 amperes, the last line in the table above is neglected; the average watts per revolution per minute of wattmeter disk is then 31.02.

Resistance of Motor Field Coils.

Ammeter No. 1940.	Coil temperature, 5.5 degrees C. Voltmeter No. 3082.	Field resistance (ohms).
90	3.70	0.0412
71	3.10	0.0437
75	3.25	0.0434
71	3.15	0.0444
70	3.10	0.0443
72	3.15	0.0437
72.5	3.20	0.0442
72	3.15	0.0450
70	3.15	0.0450
71	3.15	0.0444

Average (at 5.5 degrees C.).....0.0439 ohms.

As the field temperature during the service test was 33.5 degrees by thermometer, and the actual temperature of the wire presumably about 12 degrees higher, or 45.5 degrees C., the resistance during the test was

$0.0439\ [1 + 0.004 \times (45.5 - 5.5)] = 0.051$ ohm.

Square Root of Mean Square Current.

From field loss wattmeter:

Average loss $5.47 \times 31.3 = 171$ watts.

Hot resistance of field coils = 0.051 ohms.

Square root of mean square current $= \frac{171}{0.051} = 57.9$ amperes.

Rating of Westinghouse No. 38-B 220-Volt Motor.

For continuous operation at full voltage, 55 to 60 amperes, for 40 degrees rise by thermometer, with air temperature at 25 degrees C.

Since the air temperature during the test was about 5 degrees C. the rise of temperature to be expected from the square root of mean square current (57.9 amperes) should be (by American Institute standard), 40 (1 — 20 × ½ per cent.) = 36 degrees C.; while the observed rise was 28 degrees.

Test No. 2. Skew Table for 14-Inch Mill.

The general arrangement of the machinery is shown in the diagram, Fig. 3. The machinery is not under cover.

Mode of Operation.

The bar issuing from the 14-inch continuous mill is cut to 30-foot lengths by a flying shear; these bars are delivered to the skew table by the rollers AA. The bars accumulate on the skew table rollers against the stop B and the conveyor bar C; when all the bars from one slab are collected, the motor is stopped and the conveyor bar, operated by a steam engine through wire ropes, transfers the hot bars to the cooling table.

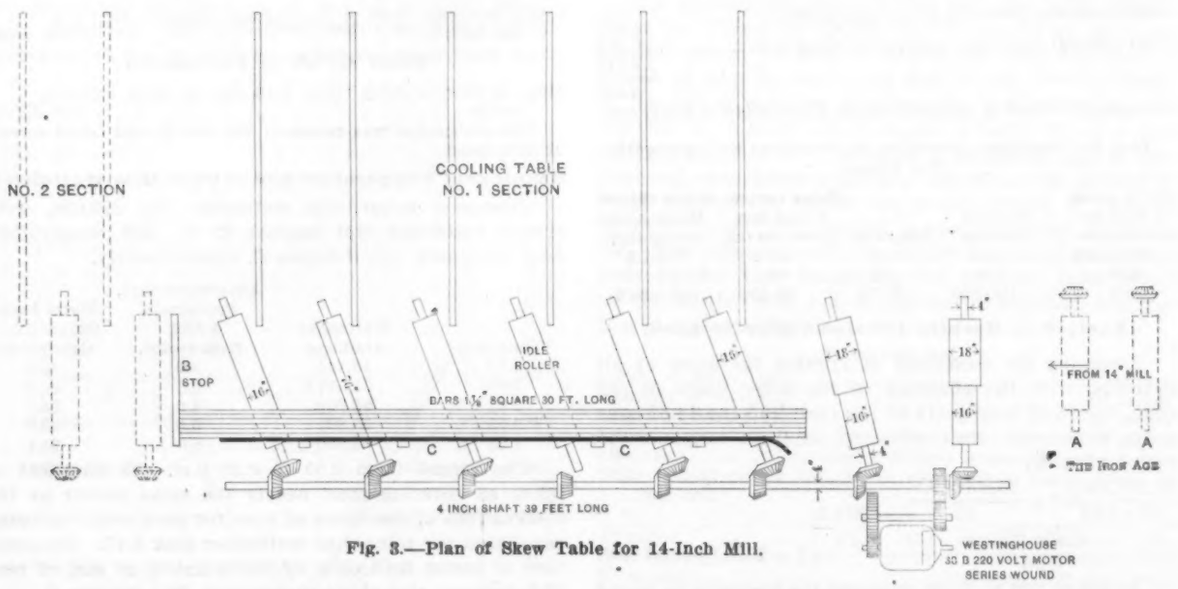


Fig. 3.—Plan of Skew Table for 14-Inch Mill.

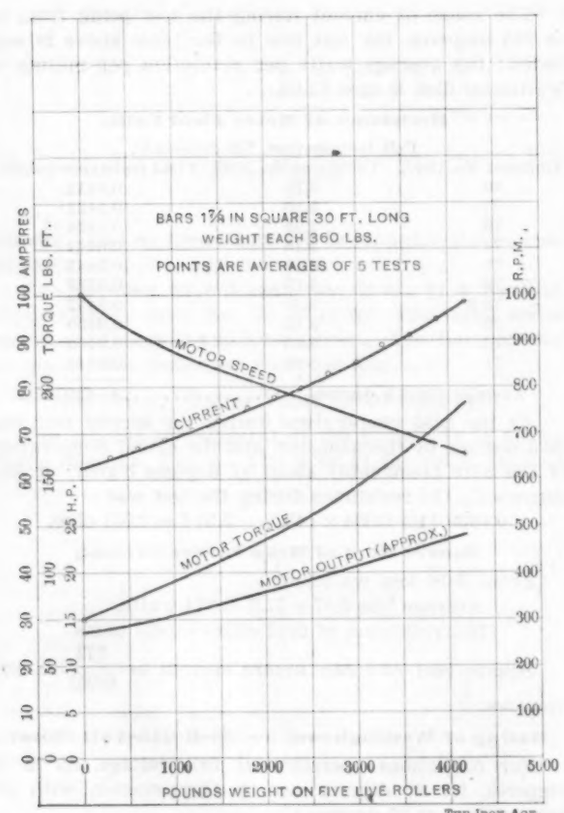


Fig. 4.—Tests of Westinghouse Motor Driving Eight-Roller Skew Table.

When the first section of the cooling table has been filled, the bars, after collecting on the skew table, are allowed to pass to succeeding sections by depressing the stop B.

The rollers run continuously while the bars are collecting, but the operator frequently reduced the speed by cutting off the current for a short time between the consecutive bars; this probably saves some power, but does not materially alter the heating effect in the motor. The maximum circumferential speed of the rollers is 700 to 775 feet per minute, decreasing to about 450 feet per minute under a load of 5400 pounds, while the bar comes from the mill at about 300 feet per minute.

The motor was comparatively cool throughout the tests, the air temperature being near the freezing point.

Dimensions and Weights.

Eight rollers, 16 inches outside diameter, 14 inches inside; 76 inches long, with 4-inch shaft extending through. Computed weight each, including shaft and miter gear, 1820 pounds. Two rollers are increased to 18 inches outside diameter for one-half the length; extra weight each, 580 pounds. One roller idle. Total weight on bearings of seven live rollers, aside from bars, 13,900 pounds. Diameter of bearings, 4 inches; length, 12 inches.

Bars carried by rollers during the test, 1⅞ inches square, 30 feet long. Weight each, 360 pounds; about five-sixths of this is borne by the live rollers. Average number of bars per slab, 15. Average maximum total load on live rollers during test, 4500 pounds.

Line shaft, 4 inches diameter, 39 feet long. Weight, including gears and couplings, 3823 pounds. Collar bearings, 7 inches diameter.

Intermediate shaft, 4 inches diameter, 4 feet 1 inch long. Weight, with gears, 630 pounds.

Gear reduction from motor, 14-68, 18-22, 17-17. Total gear reduction, 1-5.94.

Moment of inertia of machine and armature, reduced to armature, 6.26 pounds × feet² ÷ 32.2.

Moment of inertia of armature alone, 2.21 pounds × feet² ÷ 32.2.

Percentage of total moment of inertia in armature alone, 2.21 ÷ 6.26 = 35.4 per cent.

Starting Test with No Load on Rollers.

Controller was moved slowly until motor started.

Volts at brushes.	Amperes.
90	95
..	95
85	90
94	95
95	94
Average	91.8

Corresponding average torque, from curves, 168 pound feet.

Running Tests with No Load on Rollers.

Motor speed, 1,000 to 1,100 R.P.M. by tachometer.

Volts at brushes.	Amperes.
200	60
215	60
200	60
210	60
215	60
215	60
Average..... 209	60

The corresponding field voltage = 60 × 0.045 = 2.7 volts; 209 + 2.7 = 211.7 volts on motor, or 3.8 per cent. below the normal voltage, 220.

Average torque, 70 pound feet; average horse-power output, 12.8.

Motor speed, 500 R.P.M.

Volts at brushes.	Amperes.
100	50
100	48

Average torque, 42 pound feet; average horse-power output, 8.8.

Test in Service.

Current reading taken after each bar reached the stops. Motor speed about 1000 revolutions per minute at the beginning of run for each slab, 640 to 650 at end:

No. of bars on table.	Amperes.—Slab No. 1	2	3	4	5	Average amperes.	Average torque at motor.	Horse-power output at 220 V.
1	65	68	65	60	65	64.6	85	14.0
2	69	70	65	63	65	66.4	90	14.5
3	69	70	72	67	65	68.6	95	15.2
4	70	72	75	70	65	70.4	100	16.1
5	74	75	75	72	66	72.4	105	17.0
6	75	79	77	76	67	74.8	110	17.8
7	77	81	80	79	68	77.0	120	18.8
8	80	84	82	80	71	79.4	127	19.5
9	83	88	85	83	73	82.4	135	20.0
10	88	90	88	85	74	85.0	143	20.8
11	90	94	90	90	82	89.2	156	21.5
12	94	98	90	90	83	91.0	164	22.0
13	98	102	94	94	85	94.6	175	23.0
14	103	105	100	95	88	98.2	186	24.0

Average maximum current at starting, 202.5 amperes.

Average current for actual running time, excluding excess current at starting, 79.5 amperes.

No voltage readings were obtained during the tests in service; but since the speed of the motor, as determined by the tachometer, was on the average about 3 per cent. above the normal, while the voltage readings previously obtained averaged 3.8 per cent. below normal, the horse-power was taken from the characteristic curves at 220 volts.

Times of Motion and of Rest, by Stop Watch.

Slab Number.	Number bars.	Rollers in motion.—Seconds.	Rollers at rest.—Seconds.
1	14	90	450
2	16	97	23
3	15	95	25
4	..	90	870
			(due to cobbled bars.)
5	15	90	45
6	15	85	80
7	..	80	25
8	15	30*	30
9	..	150*	60
10	..	87	138
11	15	88	62
12	..	75	..
Totals		1,057	1,808

* These two readings should probably be 90 each; but this involves no error in the long run.

Start, 2.11 p.m.; stop, 2.58.45; total time of test, 47 minutes 45 secends.

In Nos. 1 to 8 the bars were transferred to the first section of the cooling table, after collecting on the skew table; Nos. 9 to 12 to the second section.

Measurement of Resistance of Field Coils.—Armature Locked.

Temperature, 13.1 degrees C., thermometer against field coil, packed with waste.

Average volts.	Average amperes.	Resistance (ohms).
4.075	90.3	0.045

Drifting Test Under No Load.

Mean initial speed of armature (11 tests), 1029 revolutions per minute.

Mean time coming to rest (11 tests), 11.15 seconds.

Mean number revolutions in coming to rest (6 tests), 70.8.

Considering all the machine friction as reduced to a "time average" torque at the armature, and computing from the augular momentum, this torque is

$$\frac{6.26 \times 1029 \times 2\pi}{60 \times 11.15} = 60.5 \text{ pound feet.}$$

Again, considering the torque as a "space average," and computing the kinetic energy, this torque is

$$\frac{6.26 \times 1029^2 \times 2\pi}{2 \times 60^2 \times 70.8} = 81.5 \text{ pound feet.}$$

(The time average and the space average are not necessarily equal in general.)

The motor torque at constant speeds was previously found to be

168 pound feet at starting.

42 pound feet at 500 revolutions per minute.

70 pound feet at 1000 to 1100 revolutions per minute.

While no close comparison can be made between the constant speed test and the drifting test, the latter serves to approximately confirm the former.

Analysis of the Friction of the Machine.

Assuming the coefficient of friction to be the same at all the bearings, and the efficiencies of the miter gears 94 per cent., of the 18-22 spur gears 95 per cent., and of the 14-68 gears 96 per cent., the coefficient at the bearings is found to be as follows, (computed from the motor torque when running steady with no load on the rollers):

At starting, f equals..... 0.280
At 500 revolutions per minute of motor, f equals..... 0.070
At 900 to 1,100 revolutions per minute of motor, f equals. 0.117

The friction is thus seen to be abnormally high; this is probably partly due to the low temperature of the oil, partly to bad condition of some of the bearings.

From the graphic representation of the current and the motor torque, Fig. 4, it is seen that as the load increases the additional torque per bar increases rapidly; tne increase per bar for the last bars is about double that for the first bars, although the machine friction under constant load is less at the lower speeds. Since there are at least three variable elements affecting the current required, the separate effects cannot be determined from the data obtained. The variable elements are:

1. Change in bearing friction and gear friction with changes of load and of speed.

2. Change of coefficient of friction between bars and rollers with change of speed.

3. The rise in current at full voltage corresponding to a given fall in speed is less when the speed is high than when it is low; hence the kinetic energy of the rollers retards the rise in current to a greater extent at the beginning than at the end of the run.

Square Root of Mean Square Current.

An approximate calculation, based on the test of 47¾ minutes tabulated above, shows that the square root of mean square current for this time was 48.5 amperes; but if the two long stops (after the first and the fourth slabs) had been but 30 seconds each the square root of mean square current would have been 64.6 amperes; this then represents the current for a continuous run that would have same heating effect as that of the variable current in service, assuming no accidental stops to occur. The continuous rating of the Westinghouse No. 38-B motor allows 55 to 60 amperes at 220 volts for 40 degrees C. rise in temperature.

Average Current and Power.

The average current during the test of 47¾ minutes was about 30 amperes, estimated on the assumption that the motor is kept under full voltage during each run; the average current for actual running time being taken at 81.5 amperes (from the graph). If, however, the two long stops had been but 30 seconds each the average current for the test would have been 53 amperes. With 250 volts at the generator, 28.8 amperes = 7.5 kw.; 53 amperes = 13.2 kw. The average power demands at the generator are probably reduced somewhat below those figures by slowing down the rolls whenever possible; but no data were obtained to show the extent of this saving. If, however, we assume that the current is cut off for one-tenth of the time for each ingot, the average current and power would be reduced about 5 per cent for this case, as may be seen by inspection of the amperes-torque curve for the motor.

Germany is the great potato using country of the world. It is said that 160 acres are planted with potatoes there for every 10,000 inhabitants; whereas the proportion in the United States is only about 34 acres, and in Great Britain and Ireland only 31 acres. The fact is of interest, because the potato spirit is likely to play so important a part in the future of the motor car industry.

Manufacturing Prospects in Canada.

Tariff Conditions.

TORONTO, March 26, 1904.—A year ago the manufacturers as a body were strongly in favor of protection. They are much more so now. At that time they had all the business they could attend to, many of them having orders enough to tax their capacity for six months. Profits were good, and payments were never better. There was no embarrassing competition from outside sources. Hence there was no immediate irritant to the demand for higher protection. The need for an increase of duties was not felt, but was anticipated. In all the representations made to the Government on this subject the duration of the good times period and the certainty that it must have an end were dwelt on. Signs of reaction in the United States were referred to. It was pointed out that that country was then exporting freely of classes of manufactures—notably under the head of iron and steel products—that it had been importing on a large scale the year before. Prices, already breaking across the line, would be likely to become lower as production there increased and the available demand became sated. Then there would be a tidal wave of movement of American goods toward the Canadian frontier, and to protect the national industries the tariff wall ought to be raised beforehand.

Manufacturers are now still more urgent for protection. It is no longer sought, however, as a means of warding off coming evils, but to get rid of those at present experienced. American competitors are undoubtedly gathering up a large volume of business here that would, under the conditions which held even a year ago, have dropped naturally into the hands of Canadian manufacturers. This is especially so in regard to the more or less finished products of iron and steel works. The Canadian demand has not fallen off. It is probably increasing, but more of it is being captured by Americans who quote favorable prices. Canadian farmers were never before the collective owners of so much wealth. Their standard of living has been raised as a result of their prosperity. They afford many things now that seemed to lie outside the agricultural sphere, and they have a far larger equipment within the strictly agricultural sphere. The country's buying power is perhaps not less than it was when the crops were largest and the general prosperity was greatest. So the Canadian trade is a prize worth contesting. To hold on to it the manufacturers must have higher duties or must forego a part of their profits, and the latter alternative involves reduction of wages.

In the recent debate on the address, Sir Wilfrid Laurier declared that his Government would assuredly not adopt the American idea of protection. It would, he said, be "foolish and criminal" to do so. As the question is being pressed strongly, it is deemed probable that the Government will appoint a commission to deal with it, thereby postponing Parliamentary action till after the general elections. The present session is expected to be a short one, taken up chiefly with the business of modifying the Grand Trunk Pacific Railway agreement and the passing of the new Militia bill.

The "Soo" Guarantee.

Whether the steel rail mill is started shortly or not depends on the fate of the measure the Ontario Government has introduced in the Legislature for guaranteeing an issue of $2,000,000 of 4 per cent. two-year bonds for the Algoma Central & Hudson Bay Railway Company. That corporation is included in the Consolidated Lake Superior system. If the bill passes, the financial scheme the reorganizers have in hand will, it is said, be at once completed, and $10,000,000 will be rendered available for the meeting of liabilities and the supply of working capital. The bill has received its first reading, but its passage through the House will be stubbornly resisted by the Opposition, who look upon its political bearings. The representative of the constituency is a supporter of the Government. He won the seat in a bye-election, which is protested and is to be the subject of a judicial investigation. There is reason to believe that there were irregular practices, and it may turn out that the member will be unseated. In that case there will probably soon be an election again. In any case there is likely to be, for an appeal to the province at large cannot long be delayed. Naturally the Opposition does not want to see the Government enter the contest in that constituency with this $2,000,000 guarantee on the side of its candidate. Apart from that, there are two members of the Legislature who have a judgment for upward of $400,000 against the Algoma Central Railway Company, and these members are supporters of the Government. They were contractors for the building of the road, and they say that nearly all the money is due from them to the subcontractors. As the Government has a majority of but three in the House, it is maintained on the side of the Opposition that the bill was instigated by these two members, and it is desired to have the nature of their relation to the Algoma Central contract inquired into. This inquiry is sought not merely to find out how real or how nominal was the part played by these members in the building of this road subsidized by the Province, but whether or not their connection with the concern does not disqualify them to vote on the bill. If it does disqualify them under the Independence of Parliament law then the Government is liable to defeat, for besides the enforced abstention of these two supporters from voting there may be one or two others adverse to it. Premier Ross is in a position most disadvantageous for the carrying on of Government, and there is a possibility that he may be unable to pass the bill, which is objectionable as a precedent, and which is not recommended by the estimate that is placed on the credit of the company in the open market, where it seems impossible to raise the money required.

Steel Rails at Sydney.

J. H. Plummer, general manager of the Dominion Iron & Steel Company, was in Toronto this week, having come this way from the meeting of directors held in Montreal. In an interview he said that the company will be manufacturing rails next autumn. They will be open hearth rails. The quality of the company's steel for rail making purposes has been thoroughly tested and pronounced excellent, being superior to the ordinary Bessemer. The cost of manufacture, Mr. Plummer said, would be greater than that of making Bessemer rails, but the company would depend upon the high grade to secure a market in Canada. Importations from other countries would be limited, too, by the $7 duty which would come into effect when the Sydney and Sault Ste. Marie mills got to work. The average annual consumption of rails in Canada the last ten years was 110,000 tons. Last fiscal year 180,000 tons were taken.

C. A. C. J.

Iron and Steel Production in France.

The production of pig iron in France in 1903 was 2,827,668 metric tons, of which 2,809,410 tons were coke iron, 8097 tons were charcoal pig and 10,161 tons were produced with mixed fuel. In 1902 the total production was 2,404,974 tons. Of the 1903 product 569,239 tons were foundry iron and direct castings, against 419,543 tons in 1902.

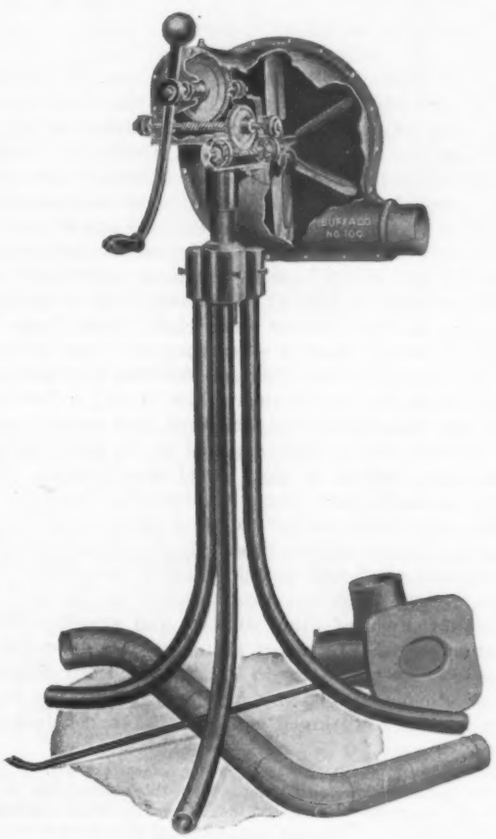
The total output of wrought iron in 1903 was 595,931 tons, as compared with 639,610 tons in 1902. Of these totals 384,428 and 369,759 tons, respectively, were products made of puddled iron, 6388 and 4002 tons, respectively, products of iron refined by charcoal, and 205,115 and 265,849 tons, respectively, were products obtained from rerolling old material. In 1903 the output of iron bars and special shapes was 549,936 tons, compared with 589,553 tons in 1902, and 45,995 tons and 50,057 tons, respectively, were iron sheets and plates.

The production of steel ingots was 1,854,620 tons in 1903, as compared with 1,568,303 tons in 1902, the first consisting of 1,172,984 tons of Bessemer and 681,636 tons of open hearth ingots, and the latter of 959,097 tons of Bessemer and 609,206 tons of open hearth steel ingots. In 1903 the production of steel rails was 234,494 tons, of merchant steel bars 792,702 tons and of sheets and plates 290,204 tons.

A New Buffalo Hand Blower.

The accompanying illustration shows a new portable hand blower recently placed on the market by the Buffalo Forge Company of Buffalo, N. Y. Its design is the result of careful study and years of experience in hand blower construction, and is said to embody all of the best features of previous designs, and several additional ones not usually found in hand blowers. Before it was placed on the market its efficiency and durability were tested by several machines in actual service.

As shown in the illustration, the motion is transmitted through spiral gears. The wheels are made of phosphor bronze and the worms of high grade steel, thus eliminating the liability of cutting or grinding, and the ends of the two upper shafts run in hard brass bushings. The blast wheel makes 38 revolutions with each turn of the crank and runs on ball bearings. The gear case, being as nearly as possible air tight and dust proof, permits the lower shaft to run in oil, feeding the lower spiral wheel, which throws the oil over the upper spiral wheel, shaft and bearings, thus constantly lubricating the interior working parts. The fan discharge can be pointed in any direction and is held by a set screw. To vary the leverage the length of the hand crank can be altered. The blast wheel is 10 inches in diameter, the fan case 12 inches and the hight of the blower from the floor is adjustable from 36 to 45 inches. The blower is furnished with a three-legged wrought iron standard, as illustrated, or with a single column standard. The machine is



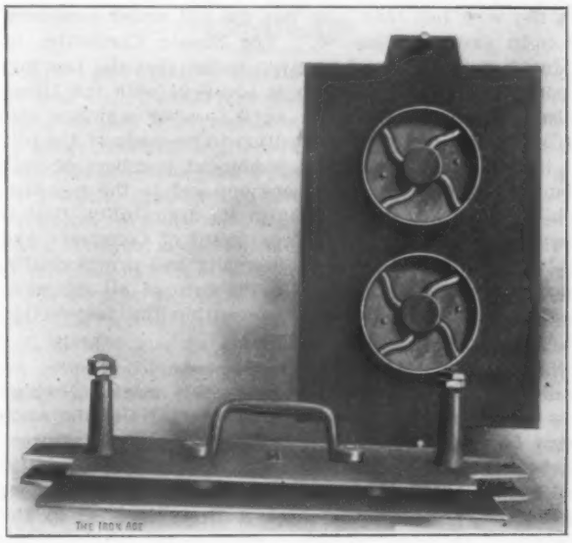
THE NO. 100 BUFFALO HAND BLOWER.

adapted to all requirements of a portable blower of considerable capacity and may be knocked down into small space for transportation. Lightness, compactness, stability, capacity and general efficiency are the points of advantage claimed for it.

Fully 37,450 of the 42,000 locomotives in the United States still retain the oil lamp and ordinary planished reflector for headlights. About 3200 have electric headlights, using the ordinary reflector, and generating the electric current with a small steam motor of the reciprocating or turbine type. There are some 1650 acetylene generators now in use for generating gas for locomotive headlights.

Harris Simplex Molding Machine.

A new molding machine recently patented is an improvement over many existing types of molding machines because of its simple construction, light weight and the small amount of space it occupies. Another consideration, hardly less important, is its low first cost. The machine, if such it may be called, consists of two plates, the upper carrying the pattern being provided with sleeves which fit over guide posts on the lower, or stripping plate. The stripping plate is cut out to fit the pattern closely and allow the latter to project through it in an inverted



View Showing Pattern and Stripper Plates for the Cope and Pattern Plate for the Drag.

HARRIS SIMPLEX MOLDING MACHINE.

position when the plates are in close contact with each other. The guide posts on the stripper plate are provided with stop nuts, which regulate the draw of the pattern and allow the upper plate to be lifted independently of the lower one until the pattern is clear of the stripping plate. In practical working the flask is adjusted over the plates with the pattern turned upward, and is filled, rammed, struck off and rolled over. The operator then grasps the handle of the machine connected to the pattern plate, and as he raps it with one hand to loosen the pattern from the sand, he lifts gently with the other. A continued upward movement raises the entire machine as soon as the sleeves of the pattern plate come in contact with the stops on the guide posts of the stripping plate.

When the patterns are not symmetrical, separate plates have to be made for cope and drag, but this is not a serious disadvantage on account of the little room they occupy. A decided gain is the fact that such a piece of apparatus is not too expensive to be used on jobs that would cost too much if the usual forms of molding machines were employed. The illustration shows a bench machine, but it may also be used on the floor, and in larger sizes always is.

The machine is controlled by Harris & Co., 65 South Canal street, Chicago, who are selling shop rights to manufacturers, so they may build machines for their own use, thus enabling them to provide themselves with the apparatus at a nominal cost.

The Milwaukee Gaslight Company have been erecting a new gas works, which embodies the most advanced practice in modern gas engineering. A gas engine driven electrical plant will be employed for furnishing motive power to the various auxiliaries throughout the works, all of which will be operated by electric motors. The present equipment consists of one 250 horse-power Westinghouse horizontal double acting gas engine, driving a 150-kw. generator and three 125 horse-power gas engines belted to 75-kw. generators. Provision has been made which will permit an extension of the equipment as may be necessary. The entire electrical distribution system operates at 250 volts, direct current.

The National Eight-Hour Bill.

Manufacturers Seek Its Reference to Department of Commerce and Labor.

WASHINGTON, D. C., March 29, 1904.—The campaign of the manufacturers and employers of the country to prevent the enactment of a national eight-hour law is rapidly coming to a crisis, and the fate of the bill so far as the present session is concerned will probably be determined within the next fortnight. The House Committee on Labor closed the hearings upon the measure on the 26th inst. and now has the bill under consideration in executive session. The Senate Committee on Education and Labor has given notice that the hearings upon the Senate bill, which is identical with the House measure, will terminate on April 5, after which a vote will be taken as to the disposition to be made of the bill. It is the opinion of several prominent members of both committees, some of whom are opposed to the measure, while others are in doubt as to its desirability, that it should be referred to the Department of Commerce and Labor for a report as to its necessity and practicability, such reference being usual in the case of all measures dealing with subjects that come within the jurisdiction of the executive departments.

All Trades Interested.

Never before in the history of this measure, which has been pending in Congress in substantially the same form for the past eight years, have the manufacturers throughout the country, irrespective of trade and without regard to whether they are Government contractors or subcontractors, shown such a lively interest in the movement to defeat the bill. Some have traveled thousands of miles and have remained in Washington for many days in order to appear before the Congressional committees to protest against the pending measure. The National Association of Manufacturers, with all its numerous ramifications, has been strongly in evidence as the leading force in the movement, while the National Metal Trades Association, the Citizens' Industrial Alliance of America and the employers' associations in all sections have sent their representatives to the capital to urge Congress to pause before taking a step that it is believed would be disastrous to the industrial interests of the country.

The witnesses before the two committees during the past week have included Harold Lomas of the Crocker-Wheeler Electric Company, Ampere, N. J.; Secretary Bartlett of the Boston Metal Trades Association; F. B. Gordon, a cotton manufacturer of Columbus, Ga.; F. E. Calloway, treasurer of the Unity Cotton Mills, La Grange, Ga.; D. A. Tompkins, Charlotte, N. C., a well-known builder of cotton mill machinery; J. J. Spalding, a cotton manufacturer of Atlanta, Ga.; John Radcliffe, Millville, N. J., a dyer of cotton goods; M. F. Bowen and J. C. Smith, representing the Buffalo, N. Y., Board of Trade and the pottery industry; R. G. Salomon, a prominent tanner of Newark, N. J.; James Reilly, secretary of the Newark, N. J., Board of Trade; Charles B. Baldwin, New York, president of the Paper Box Manufacturers' Association; James A. Coe, Newark, N. J.; Frederick W. Job, secretary of the Employers' Association of Chicago; George S. Boyle, editor of the *Municipal Gazette*, Wilkesbarre, Pa.; Herbert Miles, Racine, Wis., and others. The labor interests were represented by Samuel Gompers, president of the American Federation of Labor; James O'Connell, president of the International Association of Machinists; Andrew Furuseth of the Seamen's Union, Milford Spohn of the Central Labor Union, and others.

Southern Industries Imperiled.

A significant feature of the hearings before both committees was the earnest appeal made by the representatives of Southern industries not to disturb industrial conditions in that section. Mr. Tompkins, who made the principal statement on behalf of the South, said that that entire region was just beginning to recover from the effects of the restricted labor conditions that prevailed throughout the period of slavery and during reconstruction times. The industries of North Carolina, Alabama and Georgia, he said, were slowly but surely recovering their former prestige, and blast furnaces, rolling mills, cotton mills, cotton oil crushing plants and many other industries were being established in sections in which for many years farming was the only occupation of the people. Wages in the South were lower and hours longer than in the North, but the conditions of labor were easier and the cost of living lower. The people were in better circumstances to-day than ever before in the history of that section. The industries, however, depended upon such slight advantages as they now possess for their existence, and the passage of any measure which would embarrass manufacturers in that region who now had Government work and which would operate to force the general adoption of an eight-hour day would mean ruin to many establishments and would set the South back 50 years in its progress.

Secretary Job of the Employers' Association of Chicago declared that the laboring men of the country had no idea of the real character of the pending bill, and that if they understood that its operation would prevent working overtime, with increased compensation, they would oppose it to a man.

Asking Reference to Department of Commerce and Labor.

With a view to securing the reference of the pending bill to the Department of Commerce and Labor by both Senate and House committees, Judge J. K. McCammon, counsel for important iron and steel interests, shipbuilders, &c., has filed with the committees a memorandum outlining the character of the information which the Department should be requested to furnish—namely, "how far the labor situation would be affected by the passage of the pending bill, S. 489; the necessity for the passage of the bill; the edditional cost, if any, to the Government in the matter of its purchases and supplies if such a bill should become a law; to ascertain whether Government contractors in manufacturing lines especially affected by the bill would continue to contract with the Government if the bill becomes a law; to investigate and report more especially what effect a new system introduced in the industrial world would have at this time, particularly upon the proposition to prevent either employer to employ or employee to work longer than eight hours under any conditions except those of emergency, &c.; also to investigate and report how far Congress would be justified in confining the application of such a law to only a few industries, say the manufacture of steel and armor used in shipbuilding and by those engaged in the construction of ships; what effect, if any, would the adoption of the policy proposed have upon shipbuilding interests generally, and whether or not this is a proper time to apply the proposed new system especially to the manufacturers of iron and steel and to shipbuilders; also why, if the bill is a proper and just one, it should not be applied to the manufacture of other articles and supplies for the Government; also to report as to the rate of wages and hours of labor prevailing in British and Irish shipyards, and whether there is any arbitrary restriction on the hours in which workmen can work." In conclusion, he said:

> By complying with our request the committee will be pursuing the method invariably adopted by the committees of both houses of Congress—namely, to obtain reports from departments as to the effect of a bill upon governmental and private interests. Similar requests are made by other committees of both houses of Congress to heads of departments concerning the army, navy, postal and Indian service, rivers and harbors, &c. Before enacting tariff legislation, schedules are prepared by experts in the Treasury Department and full reports are made by technical men. The far reaching consequences and probable injury to the American manufacturing world by the enactment of the pending bill would warrant the adoption of similar care by your committee. In this connection we think it proper to state unequivocally, believing that our statement cannot be successfully refuted, that the proposition making it unlawful to permit any laborer or mechanic employed upon work done for the United States to work more than eight hours in any one calendar day has not been investigated by any commission or Department. On the other hand, taking into account the magnitude of the questions involved, the investigation by the committee has been wholly superficial.

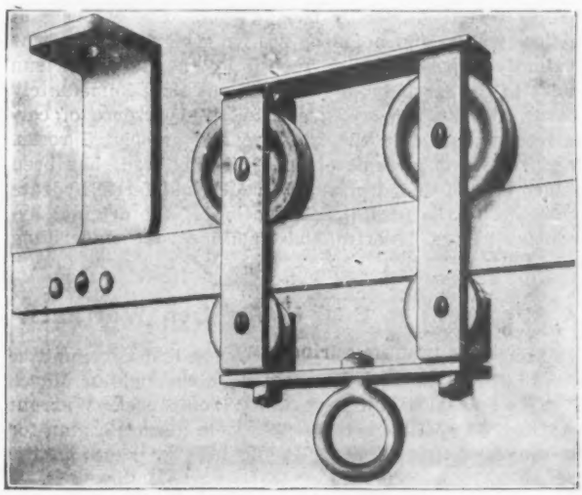
Prominent members of both Senate and House committees are very favorably disposed toward this suggestion, which they regard as promising to shed more light

on the subject than has yet been obtained from the conflicting statements of the friends and of the opponents of the bill. A vote will be taken upon a motion embodying this proposition before the committees determine the character of their reports to their respective houses.

W. L. C.

Improved Form of Overhead Tracking.

A new form of bar track and trolley, which though simple possesses many features of merit that will appeal to users of such apparatus, is shown in the accompanying illustration. A special claim is made for the method of supporting the track. The brackets or hangers have cast lugs or pins on which the track rests, thus bearing the weight of the load and relieving the bolts used for fastening the tracks to the brackets of all strain other than that of simply holding the track to the hanger. It is the usual course to depend on the bolts both for securing the track and supporting the load, and under this double strain there is a tendency for them to work loose by vibration and cause uneven joints. The trolleys are roller



BAR TRACK AND TROLLEY.

bearing and are provided with bottom wheels which restrain them from leaving the track.

There is almost no end of uses to which apparatus of this character may be put, and it would be out of the question to mention more than a few. In cotton mills it may be used for handling rolls of cloth, boxes of goods, bales of cotton, warper beams and carrying material from one department to another; in boiler rooms for conveying coal and ashes; in foundries for carrying core boxes and ladles and drawing castings; in pressrooms for handling rolls of paper, type plates and lithographic stones, &c.

In the form as illustrated track can be furnished capable of sustaining loads up to 6000 pounds. It is made by the New Jersey Foundry & Machine Company, 9-15 Murray street, New York, and is claimed to be inexpensive, durable and easily erected.

The Standard Tin Plate Company.

The Standard Tin Plate Company, Canonsburg, Pa., have made a satisfactory wage arrangement with their employees, have started up the hot mill department and expect to have the plant in full operation within a few days. This plant contains five hot mills, six sets of cold rolls, two pickling machines, two annealing furnaces for white annealing and two furnaces for black annealing, and the tin house is equipped with ten stacks. The hot and cold mills were furnished by the Mesta Machine Company, Pittsburgh. The annealing room is 80 x 240 feet, and is commanded by a 15-ton electric traveling crane furnished by the Morgan Engineering Company. The tinning machines, branders and polishers were furnished by the Anderson Machine Company, Anderson, Ind.

The company have recently reorganized their management, having secured the services of W. H. Richards as general manager, who was formerly superintendent of the Demmler works of the American Sheet & Tin Plate Company; also of Louis Follett as secretary and assistant general manager, who formerly had charge of the operating department of the American Sheet & Tin Plate Company, with headquarters in New York city.

A Test of Ferro-Concrete and Ordinary Steel Construction.

The ferro-concrete Ingalls Building at Cincinnati is finished and tenants are now moving in. Readers of *The Iron Age* will remember that several months since we made mention of the fact that the concrete builders and structural iron men would in the near future arrange for a test to prove which kind of structure was actually fire proof. We are now, through the kindness of Harry Hake, architect and chairman of the Advisory Board, able to give full details of this proposed test. Two buildings are to be erected, one of ferro-concrete construction and one of iron and steel. Each building will be 32 x 48 feet, divided into panels 16 feet square. This will give ten exterior columns and two interior columns one story high, 12 feet in the clear between the grate bars and the ceiling or roof of the structure; to have two windows in each side and three fire doors on one side; to have five flues in the roof, 21 inches square, and extending about 5 feet above ceiling or roof. The concrete building roof is to be constructed to carry three different loads—125, 250 and 75 pounds per square foot—and the dead loads required for the floor construction are to be added to this weight. The windows are to be of wire glass set in metal frames, the doors to be approved fire doors in accordance with the regulations of the National Board of Fire Underwriters. This test being made primarily for the vicinity of Cincinnati, only local material will be allowed in the construction of these two structures. If, however, any other or outside material is to be used, a third structure can be erected, but the same must be done at the expense of the party desiring such test made. In the concrete-steel structure one-half of same is to be built of limestone and the other half of gravel concrete. In the steel fire proofed structure the interior steel work is to be incased partly with brick and partly with fire proofing; outside walls to be of 13-inch brick wall, one-half to be laid up in lime mortar and the other half in cement mortar. Both buildings are to be plastered on the inside with lime and cement mortar, and finished with plaster of paris. Complete drawings and specifications for these structures must be submitted for approval to the Advisory Board, same to show all details of construction; also giving the composition of the different mortars, of the different concretes and of the style of fire proofing to be used. The concrete-steel shall be so designed that the stresses in the concrete and steel shall not exceed such as have been used in the buildings erected in this section—viz., for columns, compressive strength of concrete 400 pounds and for steel 12,000 pounds per square inch. For beams, girders and floor slabs compressive strength of concrete 500 pounds, tensile strength of steel 16,000 pounds, shearing stress in steel 10,000 pounds per square inch. Allowable unit stress for sectional area of column, 1200 to 1500 pounds per square inch. The first test to be made must show that the construction will sustain double the load for which it was designed without any sign of failure. All test loading is to be made by means of pig iron. The second test will be the fire and water test, same to be made by filling interior of house with coal and wood sprinkled with petroleum. For five hours a temperature of about 1800 degrees F. is to be maintained, and then a stream of water from the nozzle of a steam fire engine is to be directed on the building (mainly on the interior). After the fire and water test, if convenient, additional loading will be applied to see what effect the conflagration had on the structures.

The Baraboo Iron Range.

WASHINGTON, D. C., March 28, 1904.—A condensed but comprehensive bulletin upon the exploration work accomplished in 1903 in the Lake Superior iron region has been prepared for the United States Geological Survey by C. K. Leith. Through the courtesy of the Director of the Survey and Professor Hayes, geologist in charge, the correspondent of *The Iron Age* is enabled to present the following advance abstract relating to the Baraboo range:

During the year the Wisconsin Geological and Natural History Survey made an investigation of the newly found occurrence of iron ore in the Baraboo ranges in Southern Wisconsin. This investigation was carried out by S. Weidman.

A pre-Cambrian quartzite formation, having an estimated thickness of 3000 to 5000 feet, forms an east-west synclinorium about 20 miles long and ranging in width from 2 miles on the east to 10 or 12 miles on the west, resting on a basement of igneous rock. The upturned north and south edges of the quartzite form respectively the north and south ranges of the Baraboo bluffs, standing 700 to 800 feet above the surrounding country and above the intervening valley. This valley is occupied by formations younger than and conformable with the quartzite. Mr. Weidman has named these formations the Seeley slate and Freedom formation. The Seeley slate has an estimated thickness of 500 to 800 feet, and above this is the Freedom formation, mainly dolomite, which has a thickness estimated to be at least 800 feet, and which bears the iron ore deposits in its lower horizon.

Flat lying Paleozoic sediments, unconformably overlying the pre-Cambrian rocks, occupy the surrounding area and partly fill the valley. Paleozoic rocks range from Upper Cambrian (Potsdam) in the valley bottom to the Ordovician (Trenton) on the upper portions of the quartzite ranges. The Potsdam sandstone has a thickness ranging from a few feet to a maximum of about 570 feet in the valley. Glacial drift is abundant over the quartzite ranges and in the valleys in the eastern half of the district, but in the western half occurs only in the valleys.

The iron ore occurs in the lower horizons of the Freedom formation and is mainly Bessemer hematite, with soft and earthy, hard and black and banded siliceous phases. A very small amount of hydrated hematite or limonite is also present. The rocks immediately associated with the ore and into which the ore grades are dolomite, cherty ferruginous dolomite, ferruginous chert, ferruginous slate and ferruginous dolomitic slote—in fact, all possible gradations and mixtures of the minerals dolomite, hematite, quartz, and such argillaceous minerals as kaolin and chlorite. In the ferruginous rocks associated with the iron ore the iron occurs as hematite and also in the form of carbonate, isomorphous with carbonate of calcium, magnesium and manganese, in the form of ferro-dolomite and manganic-ferro-dolomite, and as silicates combined with various proportions of alumina, lime, magnesia and manganese, as chlorite and mica, and also very probably to a small extent as iron phosphate.

The ore deposits thus far found are all in the valley between the quartzite ranges, and because of the structure of the pre-Cambrian series it is hardly possible that ore deposits will be found elsewhere than in this valley.

The iron ore is a stratified formation and is conformable with the associated stratified rocks, both below and above. The ore bodies, therefore, have the dip and strike of the associated rocks, and are found dipping at various angles from nearly horizontal to nearly vertical

At the Illinois mine, 3 miles southwest of North Freedom, and on the south limb of the sincline, the ore deposit has a thickness of 30 to 35 feet, and bears an average of 54 to 58 per cent. metallic iron. The dip of the ore body and adjacent formation is about 50 degrees north. Between the ore and underlying Seeley slate are 100 feet of alternating beds and thin seams of iron ore with a considerable thickness of dolomite and ferruginous dolomite, ferruginous chert and ferruginous slate. Between the ore deposit and the overlying dolomite are alternating strata of similar character grading up into the nearly pure dolomite. North of the Illinois mine a thickness of 600 feet of dolomite is known to occur.

Underground exploration seems to show that the conditions and character of the rock existing at the Illinois mine prevail generally, as should be expected, throughout the valley wherever the iron formation and overlying rocks have not been eroded by the subsequent pre-Potsdam erosion. In general, there appears to be a highly ferruginous horizon near the base of the dolomite formation, having a variable thickness, probably ranging from 400 to 500 feet. This ferruginous horizon bears one or more deposits of iron ore separated by intervening strata of associated ferruginous rock. In one of the drill holes in the west end of the district nearly 200 feet of iron ore and paint rock were penetrated immediately beneath the uncomformable Potsdam sandstone, the average content of iron for this distance being about 45 per cent.

The iron ore is believed by Wiedman to be mainly a product of metamorphism of what was originally a deposit of nearly pure ferric hydrate, deposited in shallow lagoons and protected bays and formed in a manner similar to bog and lake ore at the present day, through chemical and organic processes acting upon and within shallow waters unusually rich in iron. The evidence of shallow water, and not deep sea, in which the iron was originally deposited, is furnished by the numerous sun cracks in the ferruginous carbonaceous slate immediately associated with the ore strata and the presence of carbonaceous matter in the iron ore and associated rocks. The process of metamorphism, it is believed, has been mainly that of dehydration of the original ferric hydrate analogous to the partial dehydration of the original hydrated silicates, chlorite and kaolin of the underlying Seeley slate. W. L. C.

A Movement to Deal in Pig Iron Warrants.

A meeting of pig iron selling firms and a committee from the New York Produce Exchange was held on March 24 at the office of the American Pig Iron Storage Warrant Company, 44 Wall street, New York, to discuss a plan for the introduction of trading in pig iron warrants on the Exchange. Those in attendance were as follows: F. A. Dalton of Dalton, Nash & Co.; W. W. Hearne and E. B. Blandy of Matthew Addy & Co.; A. Fowler of Rogers, Brown & Co.; H. H. Goodwin of B. Nicoll & Co.; P. P. Williams, chairman, and Mr. Truesdell, secretary, of a committee appointed by the New York Produce Exchange; Geo. H. Hull, president; F. A. Libbey, secretary and treasurer, and Geo. H. Hull, Jr., agent, American Pig Iron Storage Warrant Company.

The meeting was called to order by President Geo. H. Hull of the Warrant Company. F. A. Dalton, who was the original proposer of the meeting, was called to the chair, and Geo. H. Hull, Jr., was chosen secretary.

Mr. Hull was called upon to state the results of the canvass recently made by the Warrant Company to ascertain what furnaces favored the movement to establish a market for daily exchange dealings in pig iron warrants. He explained that the response had demonstrated that more than one-half the merchant furnace capacity of the country was represented by the signatures of officers and managers of furnace companies favorably disposed toward this movement.

Mr. Williams spoke on behalf of the Produce Exchange, stating that the Exchange was in hearty accord with the movement, its object being to increase the Exchange membership and develop an active trading in pig iron warrants through the iron houses to be represented on the floor.

A general discussion ensued in which were brought out the policy and methods of the Produce Exchange, as well as the general features of the warrant system and its advantages to every element of the iron trade as reflected by the experience of Great Britain.

A motion was adopted that Geo. H. Hull, Jr., be appointed a committee of one to secure the consent of a number of iron houses to take memberships on the Produce Exchange and to report at a subsequent meeting to be called by the chairman.

A Large Spur Gear Cutter.

A machine for planing the teeth in spur gears up to 20 feet in diameter and 54-inch width of face has been built by the Gleason Works of Rochester, N. Y., for the Cambria Steel Company, Johnstown, Pa., and was designed by Wm. Gleason. The accompanying engravings, Figs. 1 and 2, show views of the machine taken from opposite sides, the first being generally spoken of as the front view and the second the rear view.

As shown in Fig. 1, the mandrel which carries the work revolves over a pit, so that the gear to be cut may extend below the level of the base of the machine. While the capacity of the machine is nominally limited to gears of 20 feet in diameter, it may be extended to gears 30 feet in diameter by providing a pit of sufficient depth and moving the work carrying spindle to its extreme position. The real limit to its capacity is the amount of error allowable in the dividing of the teeth. By actual testing the indexing mechanism divided the teeth on a 15-foot gear to within a limit of 0.15 per cent., which is much finer than actual practice requires. The dividing wheel, seen in Fig. 2, is 9 feet in diameter, and the indexing is done by power through the gear mechanism shown.

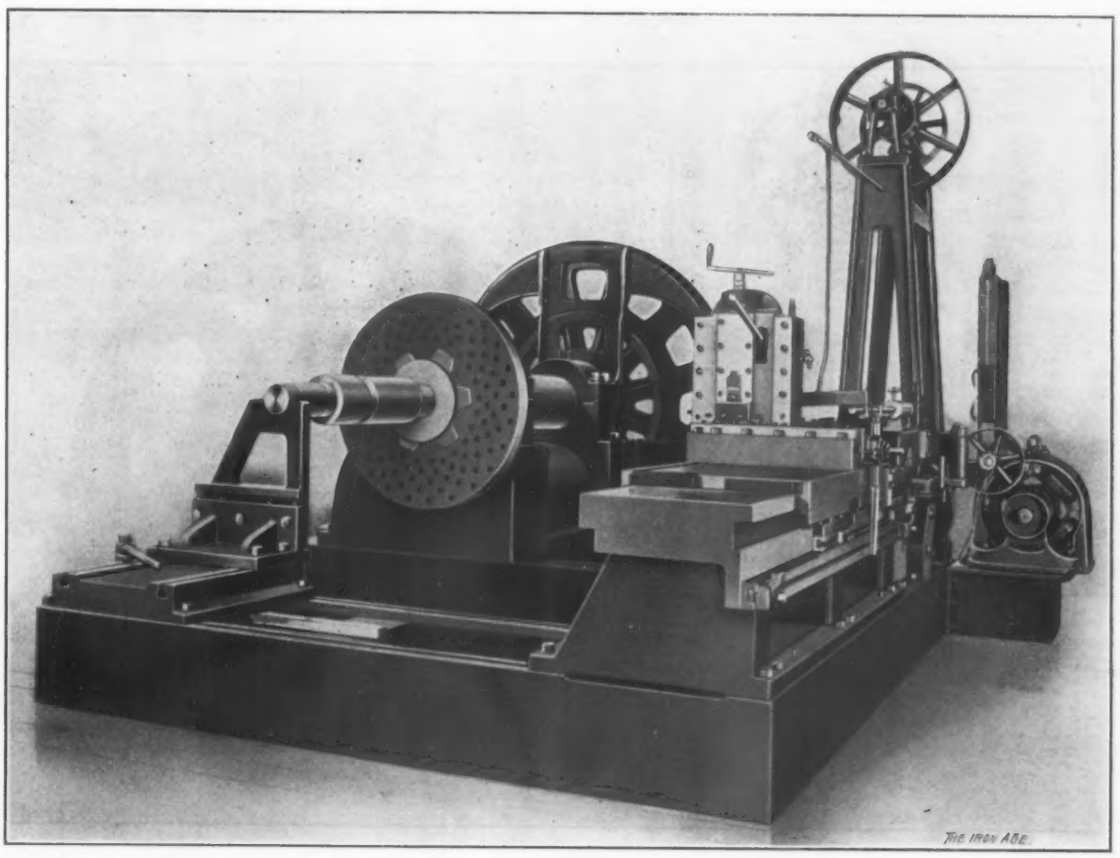


Fig. 1.—Front View of the Gleason Gear Cutter, Showing Mandrel for the Support of the Gear.

In the rear view of the machine are shown the tool carriage and guides. The bar which draws the tool slide works in a guide of box form, the rectangular opening at the end of which may be seen in the illustration, and, as will be noticed, is placed very nearly in line with the cutting point of the tool, the object being to produce a powerful movement without chattering. A 15 horse-power motor provides the drive by belt through the countershaft mounted on top of the standards, as shown in both half-tones, and from the countershaft to the shaft directly below it connection is made by the usual open and crossed belts with shipper motion as used on planers.

The large steel gear castings for the cutting of which this gear planer was designed have the teeth rough cast to save metal and insure good castings; consequently, as the work comes to the machine there is a rough, hard scale on the surface of the teeth, the removing of which is very hard on the cutting tools. The roughing is done by an inexpensive tool, resembling those used on planers, which cuts under the scale and can be operated at a high speed with a fairly coarse feed. The manner in which the tool is guided by a former so as to follow the contour of the tooth may be seen in Fig. 3, and the shape of the formers for 20-degree involute tooth cutting is shown in Fig. 4, the upper one being used for the top side of the tooth and the lower one for the under side. To remove the tool marks left by the roughing tools, a forming tool, Fig. 5, is used without formers, except in the case of very coarse pitch gears of 12-inch circular pitch or larger, when the surfaces of the teeth have to be finished entirely by single pointed tools guided by formers. This is for the reason that it is better when removing a large amount of surface to break up the cut and reduce the thrust on the cutting tools. The chips and cutting compound fall down into the pit, from which the compound is drained through a strainer and pumped by means of a small rotary oil pump back to the cutting tool.

By means of the tool formers gears may be planed ranging from 10 inches in diameter up to the full capacity of the machine. Each former is stamped for the pitch diameter with which it is to be used, and a single pair suffices for the planing of gears from the smallest pitch up to one using the full length of the curve. For example, a pair marked for a 30-inch diameter will cut any gear of that size 4 diametral pitch to 6-inch circular pitch exactly right. Gears of 2-inch pitch and smaller are planed with tools which answer for both the sides of the teeth and the fillets at the bottom of the teeth, but on the coarser pitches the sides and fillets are formed with different tools. On such work two cuts are necessary—a roughing cut with coarse feed and a light finishing cut with a fine feed and high speed.

To resist the thrust on the cut there is a thrust brace, P, Fig. 3, for the purpose of bracing the gear at the rim. The pressure of this brace must be released by

means of lever R each time the gear is indexed, and again applied after the gear has come to a stop and before the tool starts the next cut. The sliding bar S, Fig. 3, on the thrust brace is provided with tapped holes for the insertion of various lengths of bars to accommodate the different widths of face of gears to be cut. The support Q on the opposite side of the gear prevents its being sprung by the thrust brace, and also binds the gear at the rim to avoid springing it in a direction around the center when using solid finishing tools.

Measures in Aid of the Merchant Marine.

WASHINGTON, D. C., March 29, 1904.—The promoters of legislation in aid of the American merchant marine hope to be able to put their complete programme through the House within the next fortnight, and to enact it into law before the adjournment of the present session. It consists in the passage of three bills now pending, all of which are on the House calendar, including the bill authorizing a commission to investigate the necessity of Government aid of some kind; the measure extending the coastwise laws of the United States to the Philippine Islands, exclusive of the interisland trade, and the bill requiring the shipment in American bottoms of all military and naval supplies except in great emergencies.

Will Stimulate Industry.

The last two mentioned measures, known as the Frye bills, have already passed the Senate, and a day or two ago were favorably reported from the House Committee on the Merchant Marine and Fisheries. They are counted upon to furnish a very decided stimulus to both ship owning and shipbuilding interests in the United States. While the mere restriction to American bottoms of the shipment of Government supplies may not seem calculated greatly to aid American ship owners, yet the House Committee places special emphasis upon the necessity for the passage of this measure. In its report to the House upon this bill the committee says in part:

> The difficulties encountered by the United States Government at the commencement of the Spanish war should not be forgotten. It was necessary then to improvise a large fleet, not only of auxiliary cruisers, but of transports and supply ships, equal in numbers to the entire regular fighting fleet of the United States. After the available resources of our own merchant marine had been exhausted, whereby was supplied 69 vessels, aggregating 67,000 tons, our Government was compelled to purchase some 51 foreign steamers, aggregating 128,000 tons and costing nearly $10,000,000, as many as could be procured before the actual outbreak of hostilities. Such was the inevitable haste of the negotiations that an excessive price was paid for many of these foreign craft, and some of them, on careful examination, were found to be unfit for our exacting service.
>
> The military conflicts of the United States in the future will be mostly upon the sea or depend upon the sea power of the country for their successful termination. Recognizing this situation, Congress at this session will enact a naval appropriation bill of nearly $96,000,000 to provide for our naval defense and to protect our oversea commerce. This immense sum will amply provide for this most important national purpose.

Ample Tonnage to Carry Trade.

The chief criticism of those who doubt the wisdom of extending the coastwise laws to the Philippine Islands has been that vessels flying the American flag were lacking to take care of the trade already developed. To meet this point the House Committee submits a table of vessels now available, aggregating over 140,000 tons. The bill has been so amended that its provisions will not take effect until July 1, 1905. By that date the committee predicts "there will be found an amount of shipping quite sufficient to justify the full removal of the present limitation, and that our own vessels will be able to transact all the business required."

It is now regarded as probable that the House committee will secure from the Committee on Rules a special order for the consideration of the three bills referred to during an interval between debates on current appropriation bills within the next fortnight. Under such an order the passage of all three bills would be assured.

W. L. C.

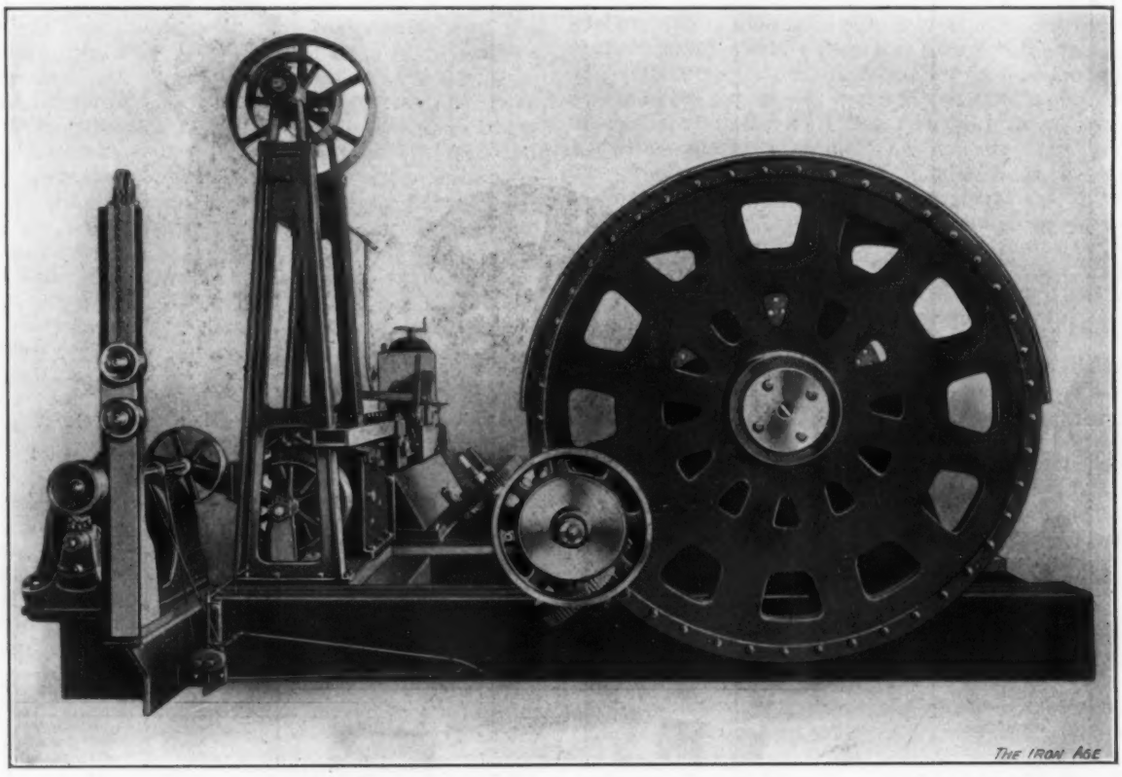


Fig. 2.—Rear View, Showing Indexing Mechanism.

A New Commercial Telegraph Company.—Chicago capitalists, including among them Col. G. Watson French of the Republic Iron & Steel Company; Henry E. Weaver, president of the Henry E. Weaver Coal Company; Col. Henry L. Turner, Harry Rubens and H. D. Critchfield, have incorporated the United States Telegraph & Telephone Company under the laws of Illinois and will enter the field as competitors of the Western Union and Postal Telegraph companies and various telephone companies in the transmission of messages over a territory embracing Chicago, St. Louis, Kansas City, St. Paul, Minneapolis,

Omaha, Duluth and Milwaukee and other leading points. The company are capitalized nominally at $2500, but several million dollars will be represented in their directorate. The new company have absorbed or will absorb the National Telegraph News Company of Chicago, operators of what is known as the "wide tape" ticker system; the Empire Clock Company of St. Louis, operating an electric telegraph clock system, and the Chicago & Milwaukee Telegraph Company, who operate between the two cities, carrying principally grain and stock quotations and information. At the start the new concern will make a strong bid for commercial work, carrying over the circuit the same class of business as is now handled between Chicago and Milwaukee by the Chicago & Milwaukee Telegraph Company. The headquarters of the new company will be in Chicago.

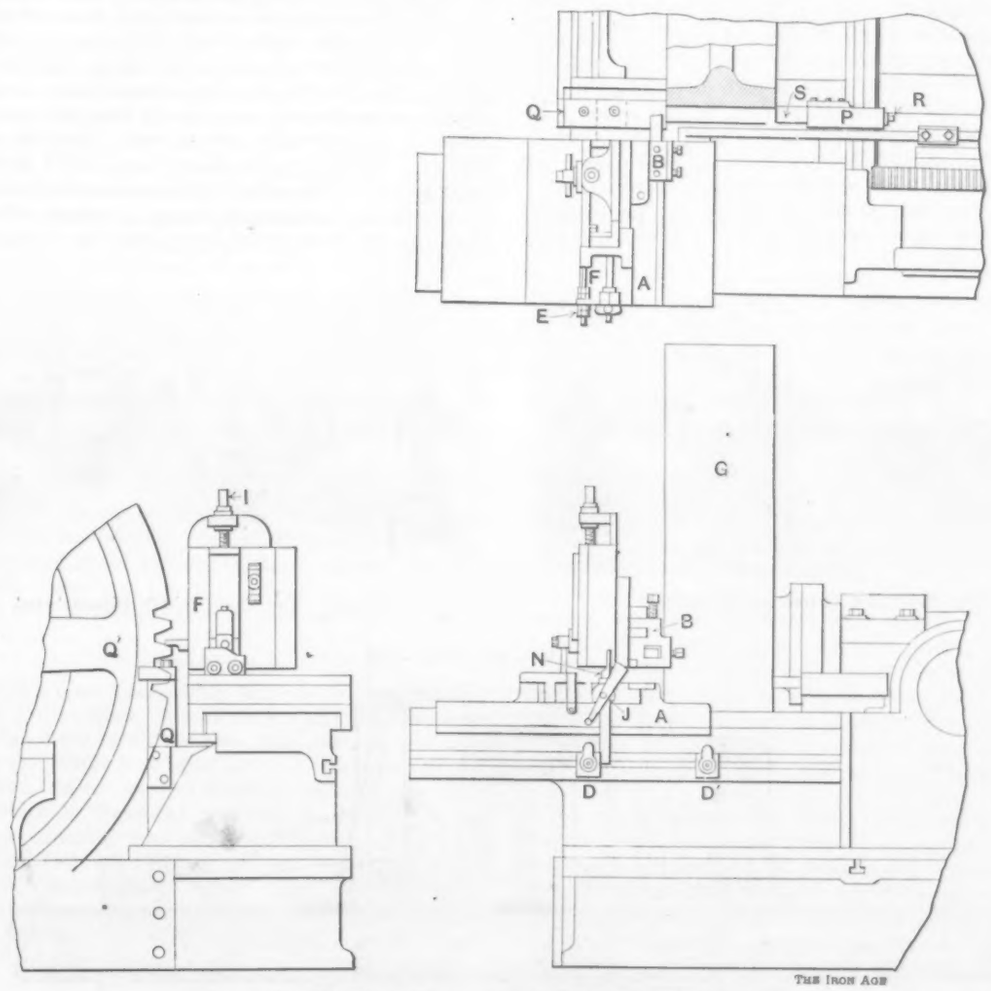


Fig. 3.—Three Views of the Tooth Cutting Mechanism.

By the incorporation of the Du Bois Southwestern Railroad Company the Goodyear interests of Buffalo, owners of the Buffalo & Susquehanna Railroad, have obtained a charter to construct a line to within about 50 miles of Pittsburgh, extending from Sykesville, Jefferson County, to South Bend, Armstrong County. The capital stock of the new company is $500,000.

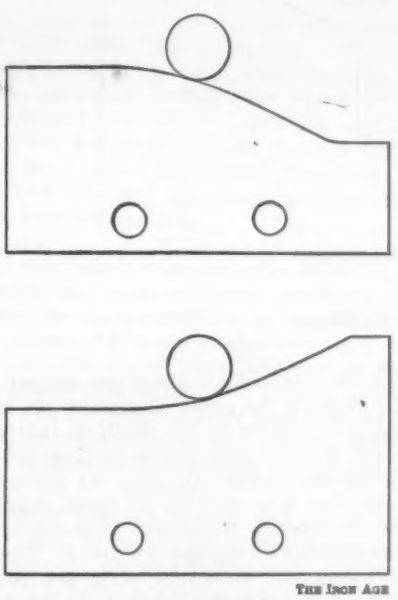


Fig. 4.—A Pair of Formers for the Upper and Lower Faces of 20-Degree Involute Teeth.

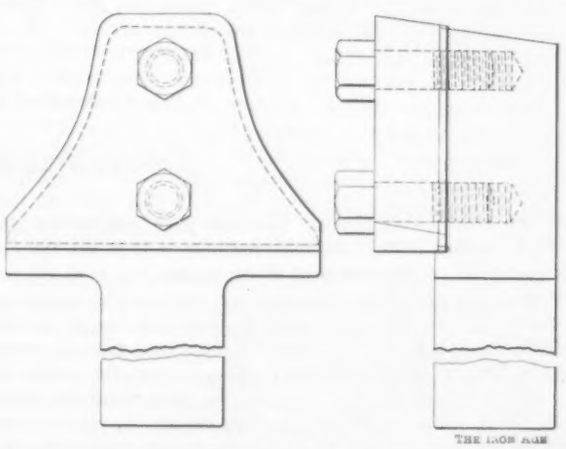


Fig. 5.—A Typical Forming Tool; Used Without Formers for Finishing the Teeth.

A LARGE SPUR GEAR CUTTER.

A One-Belt Reversing Countershaft.

A mechanism embodying features not found in other power transmission machinery is the one-belt reversing countershaft manufactured by the Smith Countershaft Company of Melrose, Mass. It is designed to drive screw machines, monitors, engine lathes and other machine tools requiring a forward and reverse drive, and, as suggested by the name, provides a drive in both directions with but one belt from the line shaft, whereas in the ordinary reversing countershaft two belts are used. Fig. 1 shows the apparatus complete with a four-step cone pulley and hangers, and Fig. 2 the reversing feature dismembered.

The construction is best indicated in the sectional view in Fig. 3. G, the driven pulley, is mounted loosely on the shaft, and has an internal gear cut in its rim which meshes with three fiber pinions, E E E, set 180 degrees apart on the studs M M M, which are held by the three-armed spider D. Through the pinions the motion is transmitted to the spur gear F, which is keyed to the shaft, revolving it in the opposite direction from G when the spider is held stationary. The web on the pulley is solid and forms an inner wall for the gear chamber, while the outer wall is formed by the casing C, which also serves as an extended hub for the pulley, replacing the part cut away to make room for the spur gear F. B is a friction rim held stationary at all times by an arm, O, through which the shipper rod passes, and the extended hub of the spider D runs freely within it. A cone friction, A, threaded to the hub of spider D, is capable of being clutched to the rim friction B to hold the spider stationary when using the reverse drive. On the opposite side of the pulley, friction H is keyed to the shaft, being held in position by headless set screws. The spools L slide on the shaft and are operated simultaneously in the same direction by forks on the shipper rod, which is supported by the hangers. The fingers K K K K, when expanded by the spools, draw the friction surfaces together by means of the purchase they obtain on the rings I. The latter are threaded on the hubs of the pulley and friction rim respectively, and may be adjusted to vary the pressure on the clutch faces. To prevent the fingers from wearing grooves in the adjusting rings, which would cause loss of pressure on the friction surfaces, rings J are provided and allowed to rotate with the fingers. There are also fiber rings placed between the rings I and J. When the frictions are not engaged they are prevented from coming in contact by music wire springs shown in the hubs of the case C and the friction rim B.

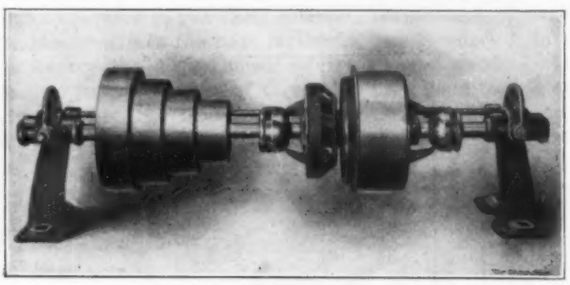


Fig. 1.—The Countershaft Assembled.

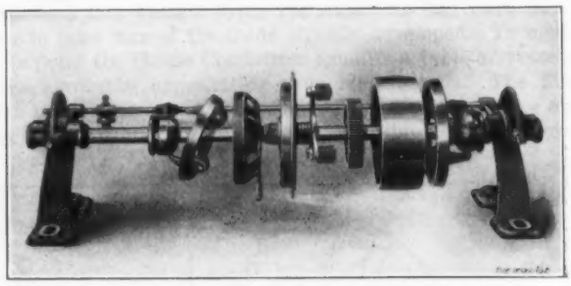


Fig. 2.—The Countershaft Dismembered.

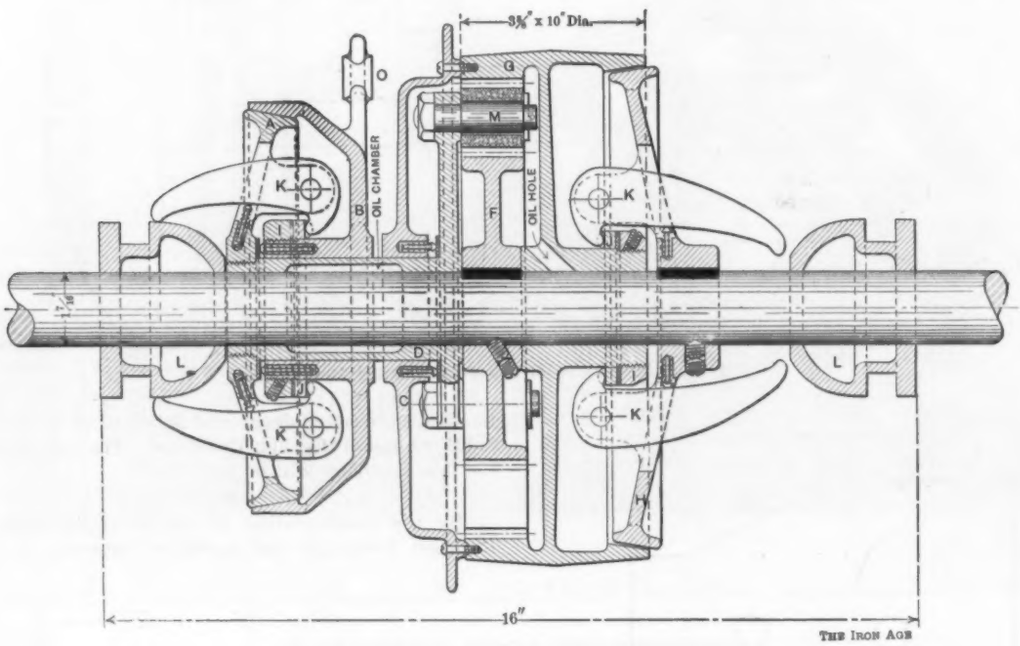


Fig. 3.—Detail of the Reversing Mechanism.

A ONE-BELT REVERSING COUNTERSHAFT.

To drive the countershaft ahead the shipper is moved to the left, drawing the pulley G against the friction H and clutching it directly to the shaft, so that the latter runs forward without gear action, for, as the opposite clutch is released, spider D, with its pinions E, the pulley G and the spur gear F, all rotate together. To reverse the countershaft the shipper is moved to the right and friction B is drawn against friction A. The opposite clutch is released, and the spider being now held rigidly, the fiber pinions reverse the direction of the drive from the internal gear to the spur gear and cause the countershaft to run in the opposite direction to that in which the pulley is being driven by the belt. When the shipper is midway between the two throws both frictions are disengaged and the pulley rotates idly.

The conical form of the frictions and the new method of manipulating and adjusting are believed to improve over means hitherto used by reducing the space and giving greater rigidity. It is a peculiarity of the con-

struction that when the frictions are engaged no strain or thrust is imposed on the shaft, and the latter could even be removed without disturbing the frictions.

A difficult problem was encountered in the choice and design of the gears to avoid noisy operation with a belt velocity of 1000 to 1500 feet per minute. The use of fiber pinions did much in the way of reducing the noise, and the inclosed case made it possible to run them in a bath of oil. By carefully planing the teeth initially and by accurately locating the pinions in the quietest running positions, it was found that the gear noise was hardly discernible. The good wearing qualities of fiber, the abundant lubrication and the exclusion of dust and grit make it reasonable to expect long life of the mechanism.

The method of oiling is effective. From the gear chamber, which serves as an oil reservoir, all bearings are lubricated except the hanger boxes, which have oil pockets of their own. The oil is drawn along the pulley hub by spiral grooves until it nears the outer end of the bearing, where it is met by another groove leading in the opposite direction, which conveys the oil back to the gear chamber, thus maintaining a constant circulation. The oil chamber shown in the hub of spider D oils the bearing on the friction B as well as the bearing on the spider. All bearings are provided with retarding grooves to prevent the oil from working out of the bearings and dropping onto the belting. The oil used is of a nonfluid nature, hence it is not affected by heat, cold or wear, and as the gear chamber is but partly filled with the oil, not enough is used to hinder the gears and consume unnecessary power.

Colorado Fluor Spar.—The Montezuma Gold Mining & Milling Corporation, Barnes City, Coaldale, Fremont County, Col., state that they have just discovered a vein of fluor spar. While fluor spar is found in a dozen States in the Union, the commercial product comes largely from three counties in Kentucky and two in Illinois. The Montezuma Company are owned by British and Dutch capital, Lord Osborne being president. N. E. Barnes of Colorado is vice-president. G. P. Kievenaar represents the Dutch holdings in that company. B. M. Gardner, The Rookery, Chicago, has been made agent for the West for the sale of fluor spar.

The annual report of the Suez Canal Company for 1902 shows that the total number of vessels passing through the canal in the three years was: 1900, 3441; 1901, 3699; 1902, 3708. The net tonnage of these vessels was: In 1900, 9,738,152; in 1901, 10,823,840; in 1902, 11,248,413. The excess of receipts over expenditures was: In 1900, $9.850,000; in 1901, $11,800,000; in 1902, $12,150,000. It will be noted that the average size of the ships using the canal is increasing; thus those passing through in 1900 averaged 2828 tons; in 1901, 2929 tons, and in 1902, 3035 tons.

The new Springfield magazine rifle, which has undergone its preliminary tests with very satisfactory results, is to replace the Krag-Jorgensen in the United States Army. By means of a larger charge of powder the muzzle velocity has been raised from 2000 feet per second in the present gun to 2300 in the new. This is accompanied by an increase in the muzzle energy from 1952 foot-pounds to 2582; and by a decrease in the maximum ordinate for a trajectory of 1000 yards, from 25.8 to 20.67 feet.

At the end of 1902 the railway mileage of the world was 352,500 miles, of which the United States had 202,471 miles, or 38 per cent., and Europe had 180,708 miles, or 34 per cent. The British Empire had 91,485 miles, or 17 per cent. of the total; the German Empire had 32,753 miles, and the Russian Empire, 31,945 miles. The United States had, therefore, six times as much mileage as either the Russian Empire or the German Empire.

The Westinghouse Air Brake Company of Wilmerding, Pa., have again offered prizes to their employees who are residents of Wilmerding for the best kept grounds and open lawns. This is an annual custom of this concern.

Central American Notes.

SAN JOSÉ, C. A., March 3, 1904.—Although Nicaragua feels slighted at the preference shown in selecting the Panama route, it is quite certain that the settlement for all time of the isthmian canal question will greatly benefit American exports. Everything has to be done on the isthmus—namely, the building of towns, stations, bridges, docks, drainage and general sanitary and fumigation works, all outside of the strictly understood building of the canal itself. It is safe to calculate an increased population of 150,000 Americans and foreigners on the isthmus within a year. Improvements at Port Limon, San Juan and Punta Arenas are already spoken of. At all three ports important sanitary works are needed; also iron drains, and a water supply piped in from the highlands. The latter work will cost several millions. If all goes well, the Governments of Honduras and Nicaragua will build docks at several of their seaports.

The President of Honduras, General Bonilla, is considering the proposition made by the British bondholders and syndicate to continue the Puerto Cortez Railroad through to the capital and then on to the Pacific Ocean at either La Brea or Amapala. An American company, in which Senator Depew is interested, is also negotiating with the Government for the building of the Interoceanic Railway. Both of these enterprises will give great impetus to iron and copper mining, and there is no doubt that 80 or 90 per cent. of the rolling stock, rails and machinery will come from the United States.

The port of Amapala, as well as La Brea, will have to be dredged, for, although they are safe harbors, they are not deep enough for anything over 3000 tons. The American engineers at the port of Manzanillo, on the Pacific, are rapidly completing the dredging in that harbor. The wharves, mostly of steel, are nearly finished, and the railroad from the East is expected to be completed within three months. Colonel Pearson is having the greater portion of the Tehuantepec Railroad inspected thoroughly and relaid with steel. In the swampy districts this is most important, but difficult owing to the deadly climate. Five shiploads of steel rails have recently arrived at Port Coatzacoalco. As soon as this work is finished and received by the Government, the new Tehuantepec line of steamers will begin running to American ports. A branch line will then connect southwardly with Belize, Guatemala, Honduras and Colombian ports.

To American business men this will be of importance, as at present these places are only reached in a roundabout way. The matter of shipping American goods to these countries, and, in fact, most of Spanish America, is anything but practical, due to transshipments and delays by going to Liverpool and other European ports to finally reach Latin America. The Three Americas Railway through Central and South America will undoubtedly be built and be of the greatest service to our exporters, but at the same time we need American bottoms to reach the important ports of these 16 different nations both on the Atlantic and the Pacific oceans. We hear much about overproduction in the United States. These countries sorely need our surplus manufactures, and the trade will never develop till they get them by direct and cheap freight routes. C.

Germany has undergone a period of partial conversion from agriculture to industry during the last 30 years. In 1871 Germany was a nation of 39,000,000 people, of whom 60 per cent. were supported by agricultural pursuits. In 1900 the population had increased to 58,000,000 inhabitants, of whom about 35 per cent. derived their support from agriculture, and the remaining 65 per cent. were engaged in some form or other of industry or trade. This conversion from agriculture to trade and industry was mainly noticeable between 1880 and 1895. During that period the increase of the working population was 18 per cent., of which agriculture gained only 0.7 per cent., while industry gained 29.7 per cent. and commerce 48.9 per cent.

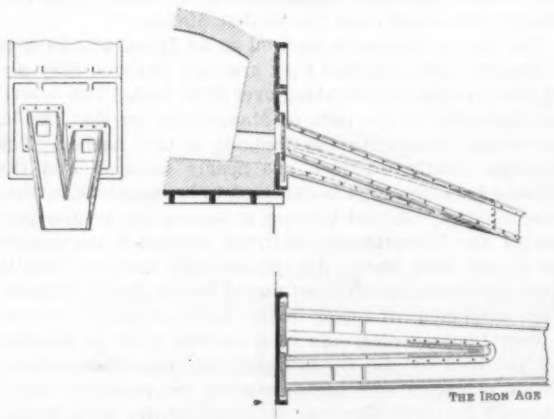
The offices of the John S. Worthington Company, iron and steel merchants, of Denver, Col., have been removed to 512 Equitable Building.

The Continuous Process in Stationary Open Hearth Furnaces.

In *The Iron Age* for April 2, 1903, appeared the abstract of an article on the continuous process in stationary open hearth furnaces, by O. Thiel, who attained the desired object of tapping as much or little of the furnace contents as required, by means of a peculiar form of tap hole there described. In a recent number of *Stahl und Eisen* is a description of a method of working the continuous process in a stationary furnace by using two tap holes at different levels, a means which Mr. Thiel passes over as impracticable, on account of the difficulty of keeping the holes in good shape. The writer is Mr. Surzycki, who in September. 1902, introduced the new method at the Czenstochau Works in Russian Poland.

The two tap holes discharge into a double runner, of which the front and side elevations and plan are shown in the figure. They are supported by a cast iron tapping plate, lined with magnesite brick and closed with dolomite, and during long uninterrupted runs have given no trouble, either by shifting or by being eaten away.

The first experiments were made on a 20-ton furnace, a 30-ton furnace was then charged, and at the present time a still larger one is being constructed. The method of working is as follows: Scrap is first charged, and when this is melted down the iron is poured in. The bath



Front View, Section and Plan of Two Tap Holes.

having become quiet and thoroughly fluid, an addition of ore and scale is made, followed by a second installment of molten metal, and this is continued until the furnace is full. Dephosphorization and decarburization are carried out by the usual methods, and when they are completed tapping takes place. In operating a 25 or 30 ton furnace, which, if the hearth is sufficiently deep, can be made to hold 45 or 50 tons of steel, and the tap hole is so arranged that from 25 to 30 tons are run into the ladle each time, a slightly less amount remaining in the furnace. The heat is finished in the ladle in the usual way by means of ferromanganese and carbon, causing a lively reaction, which, however, quickly subsides. Part of the steel is cast into ingots weighing about 1 ton each, and the balance into small ingots of about 280 pounds, which are afterward rolled into small shapes, rods, &c. The steel is quiet in the molds, rolls easily, and is of a perfectly satisfactory and homogenous quality.

After tapping the upper hole is plugged by means of dry burnt dolomite and the repairs made to the furnace, the necessity for the latter being generally confined to the slag line and possibly the bridge. A fixed amount of ore and roll scale is then added, followed by molten iron corresponding in amount to the weight of steel tapped. The iron causes a strong reaction and a considerable development of heat, whereby the temperature of the furnace is raised, although the gas is shut off. This reaction greatly hastens the refining of the metal, and having regard to the time taken by each heat is very advantageous and even necessary. The furnace is operated in this manner for one or two weeks at a stretch. When for any reason it is necessary to empty the furnace, the lower tap hole is made use of.

This method has been in use for over a year at the Czenstochau Works, giving satisfactory results. The production of a furnace, which with cold charges can only hold 25 to 27 tons, and working with 80 per cent. pig iron and 20 per cent. scrap can make 65 to 70 tons in 24 hours, has been increased to 75 to 90 tons in the same time, using 20 to 25 per cent. ore and scale, the product amounting to 101 to 102 per cent. of the metallic charge. It must not be forgotten that the pig metal contains 0.6 to 0.8 per cent. phosphorus, and that the furnace is very flat and narrow, being only 8 feet 6 inches wide, and the hearth only 20 inches deep. In the continuous process the relative amounts of the metal tapped and that remaining in the furnace are very important, which fact has been pointed out by Talbot and proved by American and English experience with large furnaces. The larger the furnace and the greater the amount of metal left therein at each tapping in proportion to the amount run out, the shorter will be the time required for each heat, and the greater the total production.

The process described above, which is based on Talbot's ideas, has the advantage over his process that it can be used on any stationary furnace of moderate size. The necessary changes can be made at a small cost in a very short time, whereas a tilting Talbot furnace needs a large expenditure of capital, and has no advantage not possessed by the less elaborate installation.

National Electric Company's New Offices.

The National Electric Company, successors to the Christensen Engineering Company of Milwaukee, have recently completed and are now occupying a handsome new office building adjoining their shops. The company are about to adopt a plan of providing free dinners for their officers, employees in the executive and the engineering departments, and the heads of the various other departments. It is the first company in Milwaukee to introduce this new system. Two pleasant dining rooms, a butler's pantry and a kitchen have been fitted up in the new office building. One dining room will be for the officers of the company and their guests, including business men who come from other cities to Milwaukee to inspect the plant. The second will be for the employees of the offices and the engineering department. The company's object is not purely philanthropic, as it is believed that the plan will be mutually beneficial to employer and employee. The company expect to be more than repaid for the expediture in the increased interest which their employees will take in the work and the time that will be saved, as the time for luncheon will be reduced from an hour and a half to 45 minutes.

The new office building of the National Electric Company is 200 by 66½ feet, three stories in hight, and is unique in its construction, the outer walls being of large cement blocks which were manufactured at the plant. The building is absolutely fire proof, as well as attractive in appearance. Six hundred men are now employed at the plant.

An interesting installation at Hillburn, N. Y., which will supply the entire Ramapo Valley with light and power from a new station now building for the Rockland Electric Company, is to use the new high powered Westinghouse gas engines. The plant will operate upon producer gas, using the Loomis-Pettibone system. The producer plant is located in a separate building, and supplies gas to the Ramapo Iron Works and the Ramapo Foundry Company for heating and metallurgical purposes, as well as power gas to the generating station. The electrical distribution system will supply power to local industries, as well as lighting for the Ramapo Valley some 14 miles in extent. The equipment aggregates 1200 horsepower, employing 350 horse-power single crank engines of the double acting type, and a small vertical single acting engine for driving the exciter. Each main engine is direct connected to Westinghouse polyphase generators, arranged for parallel operation. This plant will be one of the first alternating current stations in the country to be operated by gas power.

The National Metal Trades Association.

The Sixth Annual Convention, Held at Philadelphia, Pa.

At the close of its sixth annual convention, which was held in Philadelphia last week, the National Metal Trades Association found itself more strongly intrenched than ever before. The deliberations, in which all of the members present participated most zealously, resulted in proceedings which to a greater extent than ever paved the way of the organization for the pursuance of its great purpose of protecting the interests of the employer against encroachment of unionism. Phases of the situation which had developed during the year were discussed in cool and dispassionate manner, and placed on the right track for final disposition along the lines of wisdom, ripened by experience and sound deliberation. Considering the nature of the main topic under consideration and the natural bias which might justly be looked for in such a gathering of employers, one very commendable feature stood out conspicuously. It was the perfect calmness, though firmness, which marked the whole proceedings. There was nothing rash or precipitous in any action taken. It was a session of hard, careful work and, considering the fact that but two days were allotted to it, a great deal was accomplished.

Culling out the most important doings from the great mass of work, four things appear in significant prominence: Despite the views of a few members, headed by the new president, H. N. Covell, who are inclined to lean toward a "middle of the road" course as to agreements with the unions, the great rank and file of the association showed itself to be unalterably opposed to the formulation of a national agreement, and enthusiastically in favor of unflinching adherance to the "Declaration of Principles," concerning their relations with their employees. The subject of the relation of local associations to the National Association received the most extended and thorough discussion of any topic before the convention. Owing to the wide divergence of opinion as to the solution of this problem and the multiplicity of suggestions looking toward this end, it was deemed wise to defer final disposition of the subject until a concrete plan can be evolved which will best meet all conditions. In devising the scheme for escaping the threatening conflict of purposes between the local and national associations, cognizance is to be taken of the other national employers' associations, and an attempt made to harmonize the workings of all the local and national bodies, so as to attain sequent progression in their respective duties and thus prevent duplication as well as interference in their operation. This will be undertaken through meetings of the representatives of local and national associations, under the initiative of the Administrative Council of the National Metal Trades Association. Another important transaction was the amendment of the by-laws so as to provide more specifically the exact form of aid to be given by the association in case of strikes, and facilitating such work by simplifying the form of procedure. The fourth accomplishment of the convention to which we allude is the unmistakable indorsement by the members of the association of the administration of its affairs by the men who have been conducting them during the last year by the re-election of practically the entire line.

The meeting was eminently successful in every respect and delved to the depths of all matters presented before it in such a manner as to leave a bounteous supply of arduous work for the Administrative Council and the commissioner's office to cope with during the ensuing year.

WEDNESDAY AFTERNOON.

Report of District Committees.

At the time of going to press of our last issue, reports were being read by the district chairmen detailing the work of the year in their respective localities and outlining existing conditions. The reports were presented by the following: E. P. Robinson, first district, Atlantic Works, East Boston, Mass.; Chas. E. Hildreth, second district, P. Blaisdell & Co., Worcester, Mass.; F. A. Scheffler, third district, Marine Engine & Machine Company, Harrison, N. J.; W. Grant King, fourth district, Iroquois Iron Works, Buffalo, N. Y.; A. Falkenau, fifth district, Falkenau-Sinclair Machine Company, Philadelphia, Pa.; Thos. E. Durban, sixth district, Erie City Iron Works, Erie, Pa.; Wm. Lodge, seventh district, Lodge & Shipley Machine Tool Company, Cincinnati, Ohio; J. Kirby, jr., eighth district, Dayton Mfg. Company, Dayton, Ohio; W. D. Sayle, ninth district, Cleveland Punch & Shear Works, Cleveland, Ohio; A. C. Pessano, tenth district, Great Lakes Engineering Company, Detroit, Mich.; W. A. Evans, eleventh district, Commercial Electric Company, Indianapolis, Ind.; F. K. Copeland, twelfth district, Sullivan Machinery Company, Chicago, Ill.; E. C. Wells, thirteenth district, Quincy Engine Works, Quincy, Ill.; T. W. Sheriffs, fourteenth district, Sheriffs Mfg. Company, Milwaukee, Wis.; O. B. Kinnard, fifteenth district, Kinnard-Haines Company, Minneapolis, Minn.; E. Burkitt, sixteenth district, Southern Engine & Boiler Works, Jackson, Tenn.; G. W. Watts, seventeenth district, Canadian General Electric Company, Toronto, Ontario.

Aside from the rehearsal of details of specific cases of disagreement between employer and employee, which occurred during the year in the different districts, these reports were all alike. They showed present conditions to be very quiet with no indications of impending trouble to be feared during the coming season. They were unanimous in the statement that there are many more men looking for work than can be taken care of under the present conditions of business. From such districts where labor bureaus are in operation the reports called attention to the fact that under the efficient workings of the bureaus it has been possible to save the good men from idleness despite the oversupply of labor. It was generally shown that employers have not availed themselves of the opportunity offered by these conditions to arbitrarily reduce wages. For the sake of the men employers have in many cases reduced the number of hours of labor instead of curtailing the complement of men, although such procedure was not only less economical from an operating standpoint, but necessitated a greater outlay in the "per operative" assessment paid to the National Association.

A. C. Pessano, chairman of the tenth district, called attention in his report to the fact that his district supported a Legal Committee which is accomplishing an excellent work. He said that this committee proved its worth not only in defending the interests of concerns through securing injunctions against the lawless acts of unions, but also in defending loyal employees in the time of trouble against persecution and the boycott.

The district chairmen evinced unanimity of opinion that both the local and national organizations are necessary and that some plan should be perfected whereby they can both have such prescribed duties as will supplement and not duplicate each other. They also spoke emphatically against the idea of making any sort of agreement with the unions.

Unjust Legislation.

Daniel Davenport of Bridgeport, Conn., executive agent of the American Anti-Boycott Association, stirred the members with a ringing speech urging the association to continue its work of fighting unjust legislation at Washington. He commended the association for its excellent work against the Anti-Injunction and Eight-Hour bills and sounded a warning against the passage of the Unfair Competition bill and the National Arbitration law. He said that Judge Gray of Delaware and other prominent men had shown considerable interest in the latter measure and had manifested a desire to be heard in support of it. In explaining the true purposes of this law, Mr. Davenport said that the National Arbitration Committee which it would create would have legal power to subpœna witnesses and question them without limit, and call for all papers and books of the concerns investigated, compelling them to disclose all matters pertaining to their business, whether bearing directly upon the points at issue or not. This feature Mr. Davenport characterized as the poison in the measure, saying that it might be employed in unscrupulous hands for un-

righteous purposes and should be modified or eliminated so as not to defeat the ends of justice.

After he had concluded his speech a committee was appointed to suggest some action before the adjournment of the convention, outlining ways and means in which the association could aid in preventing the passage of the legislation referred to by Mr. Davenport. This committee was composed of Messrs. Du Brul, Falkenau, Kirby, Medart and Rogers. One of the members asked for information concerning the case of the Kellogg Switchboard & Supply Company, and Mr. Davenport gave an interesting history of it.

G. F. Steedman, chairman of the Finance Committee, recommended the continuance of the present system and amount of assessment, and that the scope of the Finance Committee be extended, giving it an executive function, so that in addition to the supervision of the finances it may also have the administration of the financial affairs of the association. He put his recommendations in the form of a resolution, which was passed.

WEDNESDAY EVENING.

The Smoker.

An informal smoker tendered to the members of the association by its Philadelphia members in the convention headquarters of the Hotel Walton proved a most enjoyable occasion. The Philadelphia hosts spared no effort in making this an event long to be remembered, and no doubt many who were there will never forget it. An elaborate vaudeville performance was given, and an excellent collation and plenty of smoke helped to instill a spirit of good cheer that was spontaneous and contagious.

THURSDAY MORNING.

Under the heading of business, scheduled in the programme as

Discussion Relative to Agreements,

A. C. Pessano, chairman of the Committee on Ways and Means, said that his committee, after considering the subject very carefully, decided to reiterate and indorse the sentiment of the Buffalo convention in the following resolution:

Whereas, This association, in convention assembled at Buffalo, N. Y., in April, 1903, adopted the following resolution:

"*Resolved,* That whenever the members of this association, either individually or as members of a local association, acting in harmony with this association, shall find it to their advantage to enter into an agreement with their employees, either individually or collectively, such action shall have the approval of this association, providing such agreement shall secure and preserve equitable conditions in the workshops of our members and shall not in any detail conflict with the Declaration of Principles adopted by this body and shall meet with the approval of the Administrative Council;" therefore be it

Resolved, That this convention hereby reiterates and confirms the said resolution.

The resolution was unanimously carried and this disposition of the matter seemed to please all present, for there was no further discussion on the subject. The subject of a national agreement was not broached.

The Relation of Local to National Association.

This topic received spirited discussion, which was opened by Chairman Covell's remarking that he believed this to be the burning question to come before the convention.

Mr. Pessano introduced a resolution which declared that the present form of organization of the National Metal Trades Association offers the best solution of the problem, and should be retained in its present form and extended along its present lines. He then spoke of the Detroit local association, saying that it started about a year ago with 18 members and now controls 75 per cent. of the concerns in the metal trades of the district. He said that it includes, besides the employers of machinists, employers of boiler makers, pattern makers, structural iron workers and several other trades, and that since the formation of the association the members have had strikes with the unions in each of these trades, all being based upon the unionization of the shops. These strikes, he said, ended in disaster to the union in every instance, and all the shops are now open shops. The employment bureau, he said, has helped to keep only the desirable men, and the association has never had occasion to call upon the national for assistance as to men or money. At present, he added, the majority of the board of the local association is composed of members of the national organization. He continued: "At the instance of the local association, and at our own expense, two men were sent to Washington to help fight the Anti-Injunction bill. These two men were deeply impressed with the fact that we, as a national association, have not the proper amount of legal talent constantly on hand to protect our interests at Washington. On January 13 Samuel Gompers was to have had his final hearing on the Anti-Injunction bill, and without even a single voice against him. A member of the Builders' Association of Washington realized the seriousness of the situation, and, merely to gain time, put in a plea to have his association heard. He wired to the National Association of Manufacturers, and within 24 hours there were something like 600 telegrams in Washington protesting against the passage of the bill. I believe that this association, having been divested of a great deal of the small detail work by the local associations, should pay greater attention to matters of national importance, and would suggest that you give careful consideration to the suggestion of maintaining representation in Washington every day of the Congressional session. State legislation should also be looked after more carefully, and work along these lines, while not very expensive, will be effective in keeping the locals in closer touch with and increasing their interest in the national organization."

G. F. Steedman, in seconding Mr. Pessano's resolution, said: "Present conditions seem to indicate that locals appear to be trying to make the National somewhat of a dead letter. Also, we now have three national associations, all working along similar lines. Since the organization of this association conditions have changed, by the appearance of the local associations. We are also confronted by another change of conditions; a change of unionism, which during the last three or four years has become more and more omnipresent. It is now in practically every branch of all trades. From the standpoint of the manufacturer, the local is necessary and the National Association is also essential. The national is also necessary from the financial standpoint. No insurance company can afford to incur too great a risk in one locality. In the same way no local can unassisted combat any very serious trouble. It must have a national to call upon in such emergencies. The local can take care of its daily needs and small disturbances, but given a serious strike it needs the help of a large organization. In the matter of strike breaking, success can only be attained through the co-operation of large cities which have men at hand that can be sent to the scene of disturbance to take the place of the strikers. If a national is necessary it must have good control over its members and the locals in order to be successful. A national organization, national in name only, would be useless. Two phases of the situation present themselves. One is the present form of organization as presented in Mr. Pessano's resolution. The other is to have the locals come in as such and federate with the National Association. In viewing the latter aspect we must admit that in the locals the members outside of the metal trades cause the most trouble. Local conditions necessarily create divergent interests within the locals, and divergent locals cannot, it seems, be brought together in a uniform national. In the matter of the defense fund, our association could not vote money to a local to fight a founders' strike without conflicting with the National Founders' Association. The same applies to the employment bureau feature.

"Referring to our present plan of organization, we have for four or five years had a uniform, concrete, tangible line of action laid out. Our members have been the leading spirits of the locals. In most cases they have led the manufacturers who are nonmembers in their thought and action. It seems to me, therefore, that if the members of the National Metal Trades Association in various localities would segregate into locals, being purely metal trades branches, the nonmembers would, by force of

national interest, gravitate into the National Metal Trades Association. The different national associations must be considered in connection with this subject. Matters of strictly local interest, such as police protection, legal protection in the form of injunctions, &c., I think, should be relegated entirely to the locals. As a national association, let us limit ourselves to national functions."

W. D. Sayle followed by saying: "I do not think that the present methods of the local associations are conducive to the building up of a strong national. It seems to me that in solving the problem we must follow one of two courses: we must either establish local associations composed of members of our National Association, or we must have local associations formed on their present lines and federated with and represented by delegates to the National Association. We all know that the locals at present are composed by 80 per cent. of members outside of our association. It is, therefore, but natural that the greater part of the trouble of the locals should be outside of the metal trades. Looking at the matter from the defense standpoint based upon the understanding that 75 per cent. of the strikes are confined to nonmembers of the national, we find that the odds are against our members. In the case of a strike against a member of the National Association, the latter organization must bear the expense of that strike. Where, however, this same member is a member of a local, and a strike occurs in the shop of a nonmember of the national, the expense of the whole strike must be borne by the local, and he as a member must contribute his share. He must, in other words, conduct his own strike without assistance from others in his local, but must bear his share in the expense of their strike. This, I think, points to a weakness in the present system."

O. B. Kinnard took issue with Mr. Sayle's statements. He said:

In a discussion of the relationship between the National Metal Trades Association and local associations, the viewpoint of a loyal member of the national, it seems to me, must first consider the interest and welfare of the national organization. The energies of a loyal constituency should be exerted along the line that produces the best results in the increase of desirable membership; strengthens the financial condition, and shapes the policy of an association, so that the greatest good can be experienced by the whole of its membership. As we consider this subject from the viewpoint of the national body, it occurs to me that the thought of most interest to use is the nature of the relationship which, did it exist, between the national and the local associations, would result in an increased strength in the former, derived from this relationship.

In considering this phase of the question two propositions present themselves:

1. Is the local association a source from which increased membership in the national body is being drawn to any great extent?

2. Is the local association of any assistance in building up or increasing the financial strength of the national body?

In presenting the first proposition to you, I would suggest my own doubts as to whether the national body does experience any increase in membership because of local organizations. I take it for granted that if there were no local metal trades associations, or local associations of kindred nature, the membership in the national body would be largely increased. I wish to state at this point, however, my desire not to be considered in opposition to local organizations, for I am not, but am simply discussing this proposition from the standpoint of the national body.

On the second proposition, "Is the local association of any assistance in building up or increasing the financial strength of the national body?" I maintain that under our present system the local associations, instead of being a financial strength to the national body, are a drain upon it, and that under the present condition of things, in many cases, this sapping of the financial strength of the national body would not work any benefit to the local.

It is an unquestioned fact, I believe, that unless all of the employers of a locality where labor difficulties are encountered can be brought substantially together, maintaining a compact and harmonious local organization, nothing of lasting benefit could be accomplished in that locality by the National Association, of which, as a usual thing, but a minor portion of the employers of such locality are members.

Is it policy for the constitution of the National Association to be so changed that it could dominate local associations unless the majority of the membership of the latter was composed of employers holding membership in the national body? I think not.

Would it be possible to change the constitution of the national body to admit of a local association membership in it, which, in many cases, is made up of both members and nonmembers of the national, and thus become an institution made up partially of individual members and partially of local aggregations? This would make such a confusion in the constituency that in place of the hitherto successful achievements of the National Association we would, in a very short time, have a chaotic condition.

Is it desirable to abandon the membership plan, under which the National Association is now working, and to substitute the representation of local associations by delegates? I think not, as it would simply mean the abandonment of the National Metal Trades Association and the substitution therefor of a federation head. What is the incentive that inspires the applicant for membership in the National Association? Is it not primarily a belief that he will be supported by the national body, both financially and morally, in the event of trouble with employees? This being the case, is it not naturally the desire of each and every member of the National Association that the association may be strong in membership and strong financially?

That which interests the applicant most, in my opinion, is evidence of growth of the National Association in desirable membership, and its development into a substantial guarantee from a financial point of view. Is it not therefore obvious that the attractiveness of the National Association will be enhanced and magnified by a steady increase in membership? It appears to me that the record of the National Metal Trades Association since 1901 should incite the praise and admiration of any fair minded person caring to look into its growth and membership, and in financial strength, from that period to the present time. Notwithstanding the fact that we are passing through a period when our increase in membership may not be expected to be as great as in times past, I think the same method pursued in the future as heretofore will result not only in a maintenance at the present level, but in an increase of a substantial nature, if not a rapid manner.

In conclusion I will say that it seems to me any attempt to materially change the relationship existing today between the national and the local associations would result in sacrifice on the part of the former, without materially benefiting the latter, resulting to some extent in the fulfillment of that old saying of the "tail wagging the dog."

This was followed by a paper prepared by Alonzo W. Whitcomb of Worcester, Mass., which was read by Chas. E. Hildreth of Worcester and was, in part, as follows:

The relation that now exists between locals and the national is not altogether satisfactory. Instead of being that of part to whole or that of part to part, it is the relation of two separate and distinct wholes trying to occupy the same place at the same time. National and local organizations are to-day separate and distinct institutions, whose jurisdictions interfere and whose interests clash. No scheme of apportionment of duty governs them and neither knows what it must do and what it must leave for the other to do; in consequence, neither is able to concentrate its efforts and thus render them most effective. Like unmarshaled forces, they are likely to work at cross purposes and so defeat their own ends.

Another phase of the matter of relation of local to national also obtrudes itself upon our attention, and this phase directly concerns us as members of the National Metal Trades Association. As a result of the interference of the jurisdiction and clash of the interests of local

and national caused by the present unsatisfactory status of each organization, each association is now the competitor of the other—each seeks the patronage of such employers as come within the scopes of both. In this competition the local has the advantage by reason of its very localism. So it happens that the local defense association is usually preferred to the national by employers because it is nearer them than the national, because its members are better known by them than the national's members, and because in it their own voice is more powerful, more controlling, than it could be in the larger association. Then, too, it is often the case that the local is so nearly adequate to the defense of its members' interests in the conflict with unionism that there seems to be no real business incentive for employers who can command the benefits of the local to join the national. The result is, locals act as serious obstacles to the growth of the national by diverting support from the national to themselves. Now it is a necessity that this association shall grow if it is to reach a measure of usefulness commensurate with the coming need for it. Therefore, as members of the National Metal Trades Association, as well as business men, it is our present duty to look to the propriety of the relation of local to national.

I have said that the evils in the prevailing situation are caused by the interference of jurisdiction and consequent clash of interests of the National Metal Trades Association and local metal trades associations. If this be true, the first remedy required is some means of putting a stop to this interference. Now it is entirely obvious that this interference cannot be stopped unless both national and local give up each to the other a part of its present jurisdiction; and a moment's consideration will show that neither can do this without at the same time becoming more dependent upon the other. Therefore, our present duty seems to be to contrive some method of bringing national and locals together in one harmonious whole.

As we all know, efforts have been made in this direction by the National Metal Trades Association. Its constitution contains a clause providing that locals may become group members of the national under certain conditions. This clause, I imagine, was expected to remove all barriers to the merging of local and national associations and thus accomplish the desired object. It has, however, wholly failed to meet such an expectation. No local has yet become a member of the national, and none seems likely to do so. The reason is clear enough. Under present conditions no advantage in the shape of either saving or gain is derivable by metal trades employers through membership in the national. As another means of bringing national and local into closer relations the national has for a long time maintained an attitude of cordial friendship for the locals, encouraging their formation, fostering their growth, sharing with them the benefit of its larger experience, and ever exercising paternal care over them, all with a view, I suppose, to so linking them to itself by the bonds of moral obligation and expediency that harmony would naturally govern all relations between it and them. This means has not entirely failed of its purpose, for, although it has not really brought national and local closer together, it has paved the way for this operation and thus accomplished something of value. At the present time both national and local are, like Barkis, willin', and we have only to determine the proper method of tying them together to be able to realize a solidarity among employers' associations that will be both compelling and beneficent.

It is probably not possible actually to join together the National Metal Trades Association and the local metal trades associations as organizations. But it is possible to unite locals and national as groups of individual employers simply, not as organizations, and perhaps such a union would prove to be as advantageous as any other. By offering to employers a service which will embody not only all its own present valuable features, but all the good features of the local as well, the National Metal Trades Association can beyond the shadow of doubt supplant local or independent organizations and draw the support which they now receive, perhaps much more, to itself.

Now the prominently attractive features of the service rendered by the local which are not a part of the national's service are local control of matters that are essentially local in character, superior efficiency and efficacy in the work of combating strikes, and low cost. All of these features appeal strongly to the average employer. It pleases him to know that, if he holds membership in the local, his interests will be cared for by his own neighbors and friends, who by reason of their very propinquity are most likely to understand his situation and needs and to appreciate the absolute necessity of upholding him for their own sake. He likes the local's power to defend him against the attacks of unions, a power which is derived from the comprehensiveness of the local's membership. As a usual things a local's membership includes a large proportion of the eligible employers who come within its range.

Then, too, employers are very favorably impressed by the smallnuess of the expense of membership in a local. Business men like economy in all undertakings which they have to support and, moreover, they usually prefer not to provide against possible future exigencies by contributing to a fund which is liable to misuse when such exigencies can be as well provided against by simply making provision for assessments in time of need. These three features, then—local control of local affairs, the power of large membership in the sections which now support locals, and low cost—must be made a part of the service of the National Metal Trades Association if it is to attain the large sphere of usefulness which we should all like to see it attain. But how can these features be made a part of the national's service? To this question I can only suggest an answer. It may be the correct one or I may have another guess. At any rate it is this: By amending the constitution of the National Metal Trades Association so as to make it conform approximately to that of the United States in so far as it relates to delegation or apportionment of authority. Let the National Metal Trades Association constitution provide that this association's executive officers, administrative council and district governments shall be counterparts respectively of the executive officers of the United States, Congress and State Governments, not only in form but in jurisdiction. Let each district govern itself wholly up to the point where matters become of national import. Let it elect its own executive officers and its own representatives in the administrative council of the national; let it raise its own funds and let it expend those funds as it sees fit under a single condition, that of contributing to the national association's support in proportion to its relative size and strength; let it take its own stand against unionism and determine its own plan of action against union aggression, and let it delegate to divisions of itself a portion of its own authority if it deems the course wise. Then let the administrative council have the authority to regulate all matters of national bearing. Let it have unlimited power of assessment upon the district *pro rata;* let it have the power to extend the national association's material support to any districts that may be in trouble and unable to cope with it alone; let it decide all questions of interference or infringement of rights between districts, and let it determine the general policy of the association as a whole. This, in the main, is my suggestion. I confess that I have not given it enough study to be able to vouch for its practicability, but at the present time it seems to me worthy of full consideration and perhaps of trial. It does not seem to entail so great a departure from the existing order of things as to partake of the nature of a wild experiment to which danger is attached, nor does it seem to threaten the continuity of this association's usefulness. My suggestion is simply a plan for making the government of the National Metal Trades Association more democratic in form than it now is. At the present time management of the association's affairs is, I think, concentrated and centralized to too great an extent. Individual members have not sufficient direct control over matters which affect them, and, on the other hand, the executive officers of the National Metal Trades Association have far too much of the burden of detail work, a state of affairs that narrowly limits the capacity for usefulness of both members and officers and prevents the service of the association from including the attractive features of the

local service. Under a more democratic control, such as I have outlined, the association would really be a confederation of locals offering to employers a service that would embrace the good characteristics of both national and local services. Its scope would be immeasurably enlarged, its influence be wonderfully increased and its stability as a bulwark of defense be secured for all time.

H. M. Leland said: I do not believe that this great question can be rightly settled by this convention. It requires the careful thought and consideration of our Administrative Council. To-day we are in control of the situation so far as wages, hours, open shop, &c., are concerned. We are now confronted by greater questions, and particularly the one of legislation. It is in coping with these, I think, that our organization is inadequate.

E. P. Robinson said that the members of the national should dominate the spirit of the local, but that he did not believe it feasible to form a federation of the local bodies. He said that there are many small concerns in certain districts which make good members of a local, but would not be eligible to a national association.

Thomas E. Durban spoke in a similar vein, and urged the members not to lose sight of the districts where but one or two members of the National Association were located, and which were unorganized as to locals.

Justus H. Schwake spoke of the moral influence of the local association in a community. He said: I think that the local organization is the best thing to encourage, because in so doing you are building up public sentiment along the lines we are fighting. Rebate the assessments of members in locals so that they can easily bear the expense of both the local and national organizations. Request the incoming Council to consider this subject, thrash it out thoroughly, and then present their findings to the association for ratification.

Nathan B. Payne said that while the present form of organization was undoubtedly good, he did not think it to be the best form possible for a period of evolution, such as that through which employers were passing at this time. He suggested formation along the lines of the American Federation of Labor. He also suggested consulting all national and local associations.

M. H. Barker said that he was heartily in favor of the resolution of Mr. Pessano, and also in accord with the views expressed by Mr. Schwake. He suggested that the locals prepare a plan by which all the members of the national could come in, and that it be submitted to the Administrative Council. It is dollars and cents, he said, that keeps the members of locals out of the national.

Thomas Shipley added considerable animation to the discussion by saying that the "local isn't worth a rap unless backed up by a national." He advocated looking squarely at the financial side of the proposition, and said that where its members were affiliated with locals the risk of the national was increased. He said that he did not believe in tying up with a lot of "tinder boxes," that were liable to flame up at any minute.

A. Falkenau said that in considering the topic, the other National Association must be considered. He thought it advisable to call a conference of the commissioners or councilors of all the national associations so as to look into the feasibility of having all members of the locals affiliate with some national organization. Such a conference, he thought, would lead to the differentiating of functions so as to result in economy in administration of all the organizations interested.

On motion of Charles E. Hildreth the privilege of the floor was extended to the secretaries of the local associations, and Henry C. Hunter of the New York Metal Trades Association, Paul Blatchford of the Chicago Metal Trades Association, Herman S. Hastings of the Worcester Metal Trades Association, Thomas M. Roache of the Manufacturers' Association of Cleveland, and J. C. Hobart, who spoke in behalf of the Cincinnati Metal Trades Association, responded. They said that it would be impossible to say to a manufacturer, "You can't join the local without also joining the National Association," and indicated that a careful canvass of the situation might lead to the suggestion of a plan whereby the two branches of the work might be better harmonized.

The matter was disposed of by the convention by amending Mr. Pessano's resolution so that the president appoint a committee of five from the Administrative Council to whom the entire matter should be submitted, and who should go over the subject with similar committees of other national defense associations, with a view of formulating a plan to overcome the obstacles now standing between the local and national organizations.

THURSDAY AFTERNOON.

Resolutions.

In the report of the Convention Committee a resolution was offered thanking the National Association of Manufacturers for their work in Washington concerning legislative matters and approving and commending the work. It was unanimously carried.

Another resolution recommended that the National Metal Trades Association join the Citizens' Industrial Alliance, provided there is nothing conflicting in the constitution, by-laws or purposes of the two organizations. This was also carried.

Another resolution, which was enthusiastically and unanimously carried, pledged the support of the association to its members in Quincy, Ill., in their extraordinary labor troubles. Commissioner Du Brul read the complete history of this case, showing it to be one of the most radical and violent instances of unionism on record.

The Nominating Committee submitted a report which met with the entire approval of the association, as was evidenced by the election of the entire slate by secretary's ballot. The officers for the new year are as follows:

President, H. N. Covell, Brooklyn, N. Y.
First Vice-President, J. W. Gardner, Quincy, Ill.
Second Vice-President, W. D. Sayle, Cleveland, Ohio.
Treasurer, Frederick A. Geier, Cincinnati.

The following councilors were elected for a term of two years:

F. K. Copeland, Chicago.
P. B. Kendig, Seneca Falls, N. Y.
M. H. Barker, Boston, Mass.
George F. Steedman, St. Louis, Mo.

At a meeting of the new Administrative Council the two important appointive offices were filled by the reappointment of E. F. Du Brul commissioner and Robert Wuest secretary.

Change of By-Laws.

The Committee on Constitutional Amendments, W. D. Sayle, chairman, reported a proposed change in Article 9 of the by-laws, which deals directly with the methods of procedure in the case of difficulties into which the association may be called. It was decided to strike out Article 9 completely and substitute a new article, giving more specific directions to be followed by the association and its commissioner in the case of strikes, especially as far as the relief of members affected by the strike is concerned. The clauses of the new article were taken up one by one and passed upon by the convention, to go into effect, provided they are approved by legal authority to be engaged by the Administrative Council.

The Committee on Legislation, of which Commissioner E. F. Du Brul was chairman, and which was appointed upon the suggestion of Daniel Davenport, submitted a report recommending that the Administrative Council have authority to present before the proper committees at Washington the objections of the association to the Unfair Competition bill and the National Arbitration law in case they were found to be inimical to the best interests of the association.

The report further provided that the Administrative Council be authorized to present the objections of the association to the Anti-Injunction bill and to answer the argument of Congressman Grosvenor, who is defending the bill.

The report also declared that the eight-hour bill now before the Senate Committee on Education and Labor is arbitrary, illogical and a dangerous measure and that the association protests against it, and orders this protest transmitted to Senator McComas, chairman of the said committee of the United States Senate.

The report was unanimously adopted.

E. Burkitt, chairman of the Auditing Committee, submitted a report showing that the accounts of the association were correct, and presented a sworn statement of the accountants to that effect.

H. L. Gantt of Schenectady, N. Y., presented a paper on "Scientific Shop Management."

F. W. Taylor of Philadelphia followed with remarks on the scientific study of rates for piece work and its relation to successful shop management, emphasizing the necessity of granting a larger incentive to the workmen to obtain a maximum output.

Resolutions were passed thanking the last Administrative Council and officers for their excellent work, and also thanking the Philadelphia members for the admirable hospitality which they had accorded the members throughout their visit.

An Inconsistency in Price of Light Steel Rails.—With the recent advance in bar steel and the strong condition of the market, and the apparent ability of the rail and billet pools to maintain the price of $28 on standard section rails, and $23 on steel billets, the fact remains that the larger rail manufacturers are still selling the light section steel rails at approximately $23, which is on the same basis as billets and $5 per ton below the price of standard sections. The inconsistency is glaring when it is appreciated that it costs several dollars per ton more to roll light section rails than heavy sections, and under ordinary conditions the price for light section rails has always commanded this premium covering the additional cost. In the recent controversy as to the equity of the price of $28 for standard section rails, the fact that the large interests were selling rails of such sections which were not covered by pool agreement at $23 and less was never discussed. There has been no explanation offered for this, but the fact remains, nevertheless. The probable explanation is that these mills are all making use of the rerolling system and are rerolling their rejected standard section rails and cobbles as well as odds and ends of billets. However, this would not fully explain the situation, as it is of course true that the primary cost of such seconds and rejections is at least equal to the original cost of good rails and billets. Consequently there must be some other reason which has not as yet developed.

The bank statement issued on March 27 by the New York Clearing House was noteworthy. For the first time the loan account exceeded $1,000,000,000. Deposits have exceeded that amount several times this year. These are huge figures, but they do not cover the entire banking business of New York, as many trust companies and the private banks are not included, to say nothing of the numerous savings banks.

Steel Theater Curtains.

Following the Iroquois Theater fire in Chicago, a general investigation was made of means for protecting the audience of a theater from fire on the stage. There were many devices suggested, among them water curtains, but the manufacturers of asbestos curtains still held that theirs was the ideal protection, notwithstanding the fact that the asbestos curtain at the Iroquois Theater proved a failure. Flimsy as it was, it would probably have prevented the spread of the fire to the auditorium long enough to permit the people to get out if it had been possible to get it clear down. It is the contention that almost any curtain, not immediately inflammable, would afford sufficient protection to cover the escape of the audience if it completely shut off any draft of air between the stage and the auditorium. To this end it is believed that steel curtains are most desirable, and considerable attention has been drawn to them of late. The city authorities and the underwriters in Chicago are inclined to insist upon them in some form, and theater managers have shown a willingness to install such curtains: in fact, many already have done so.

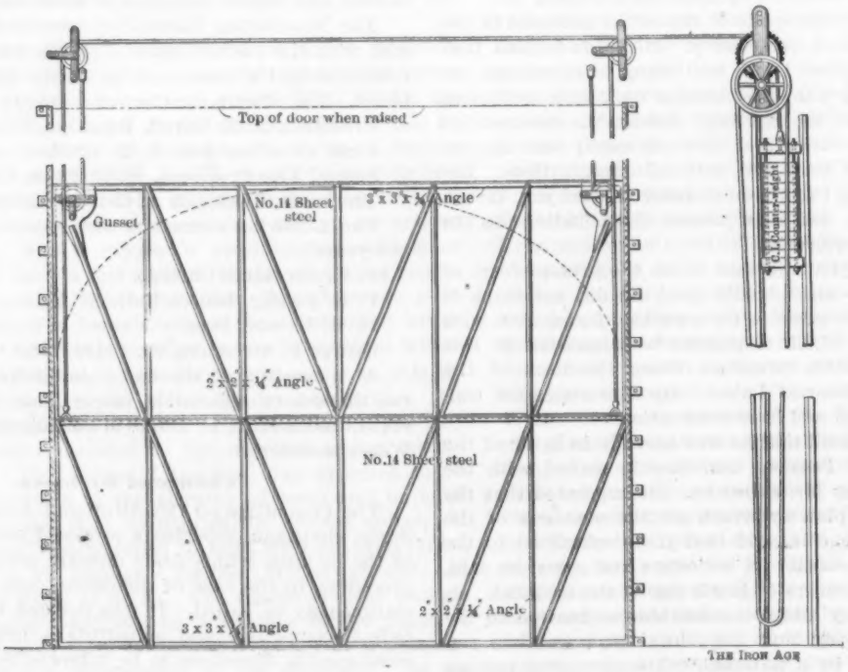

Top of door when raised
Gusset
No.14 Sheet steel
3 x 3 x ¼ Angle
2 x 2 x ¼ Angle
No.14 Sheet steel
3 x 3 x ¼ Angle
2 x 2 x ¼ Angle
THE IRON AGE

Fig. 1.—Steel Curtain in Two Parts, the Lower Section Being Arranged to Move with Twice the Speed of the Upper One.

The size and shape of the building in many theaters preclude the use of a curtain which will rise in one piece, as it requires a space of 30 to 40 feet above the top of the proscenium arch. For cases of this sort the Variety Mfg. Company of Chicago have devised a curtain that may be made in two or three sections, and raised with the lower section or sections traveling enough faster to cause all to reach the top together. Fig. 1 shows a curtain of this type in two sections, the lower half having double the speed of the upper. The curtain itself is made of 14-gauge flat or corrugated sheet steel, supported by 3 x 3 x ¼ inch steel angles and braced with 2 x 2 x ¼ inch angles. The weight of the sections is counterbalanced sufficiently so that one man, operating a winch on the stage side of the curtain, can easily raise it, and when released it will drop to the stage without force enough to injure it. The curtain slides in steel channel guides at each side, and may be provided with idlers at intervals along the tracks to facilitate its motion and allow for expansion without liability of binding. The Variety Mfg. Company also make a similar curtain in three sections and in one piece. In the case of the compound door one-half of the weight of the upper section is carried by the cable anchored into the wall above, reducing the necessary weight of the counterbalance by 25 per cent. of the total weight of the door, but with the single piece door the counterweight must nearly balance

the total weight of the door. It is estimated that the average weight of steel curtains in either of these forms would be about 3 tons.

Emery Stanford Hall, consulting architect for seven Chicago theaters, has placed in the Academy of Music a curtain of his own design, as illustrated in Fig. 2, and has awarded contracts for the placing of similar curtains in the Bijou, Alhambra and Haymarket theaters to the Sykes Steel Roofing Company. Fig. 2 gives the dimensions of the Haymarket curtain. It is Mr. Hall's belief that it is dangerous rather than safe to use a very heavy gauge steel in the curtains, as was shown by an incident in the Auditorium Theater some months ago, when the heavy curtain there in use stuck and could not be released for several hours. Mr. Hall's curtains weigh about 2 tons each, according to the size of the arch, and are made from 24-gauge black corrugated sheets protected on the stage side by asbestos. This curtain has no side bearings, but is under tension at all times between upper and lower cables which hold it in place. Those from which it is hung are carried over pulleys high above the stage and support heavy counterweights

The Huge British Naval Programme.

The British naval programme for 1904 is an expensive and elaborate one, the estimates for the year aggregating $184,445,000. This sum represents an increase of $12,160,000 upon the estimates for 1903, and is the largest sum ever voted by the British Government for naval purposes for one year. The sum to be expended upon the construction of new vessels is $58,370,880, which is also an increase of $7,588,730 upon that for 1903. The composition of the new programme is as follows: First-class battle ships, 2; armored cruisers, 4; destroyers, 14; submarines, 10; making a total of 30 vessels to be added to the fleet.

During the past 12 months, from April 1, 1903, to March 31 of this year, the British navy has been augmented by 40 ships, composed as follows: Battle ships, 6; armored cruisers, 9; second-class cruisers, 1; sloops, 2; submarines, 3; destroyers, 11; torpedo boats, 8. By April 1 of this year the following ships will be in course of construction: Battle ships, 8; armored cruisers, 13; second-class cruisers, 1; third-class cruisers, 4; scouts, 8;

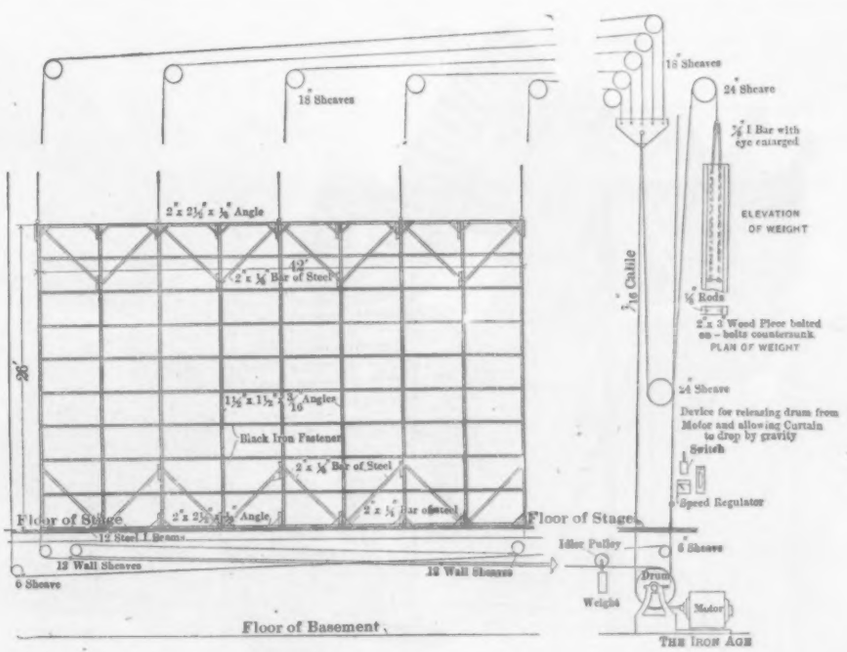


Fig. 2.—Steel Curtain in One Piece; Held Without Guides by Tension Cables at Both Top and Bottom.

in the basement which keep them taut, also allowing for expansion and contraction.

Under ordinary circumstances the curtain is raised by a motor connected through a worm gear with the drum around which the cables pass, but in case the motor is out of order, by pulling a controlling rope attached to the lever of the drum the latter is disengaged from the motor and the curtain can be raised by hand. An electric button is placed on every fly floor and also at a point in the house, each button having the right of way over the rest of the machinery, so that by touching it the curtain may be instantly lowered. The lowering is effected by counterbalancing weights which weigh 200 pounds less than the curtain, allowing for friction and permitting it to fall by its own weight without shock to the stage floor. The motor which raises the curtain runs at four different speeds and is controlled by switches in the flies.

A bill is to be introduced at the present session of Congress to permit the use of untaxed denaturalized alcohol for lighting, heating and power purposes. Denaturalized alcohol, as is commonly known, is alcohol rendered unfit for human consumption by the addition of benzol, or some other such substance. Germany has a system by which denaturalized alcohol is not taxed, or at least not to the extent to which ordinary alcohol is, and, as a result, the alcohol motor and other devices using alcohol have been much advanced

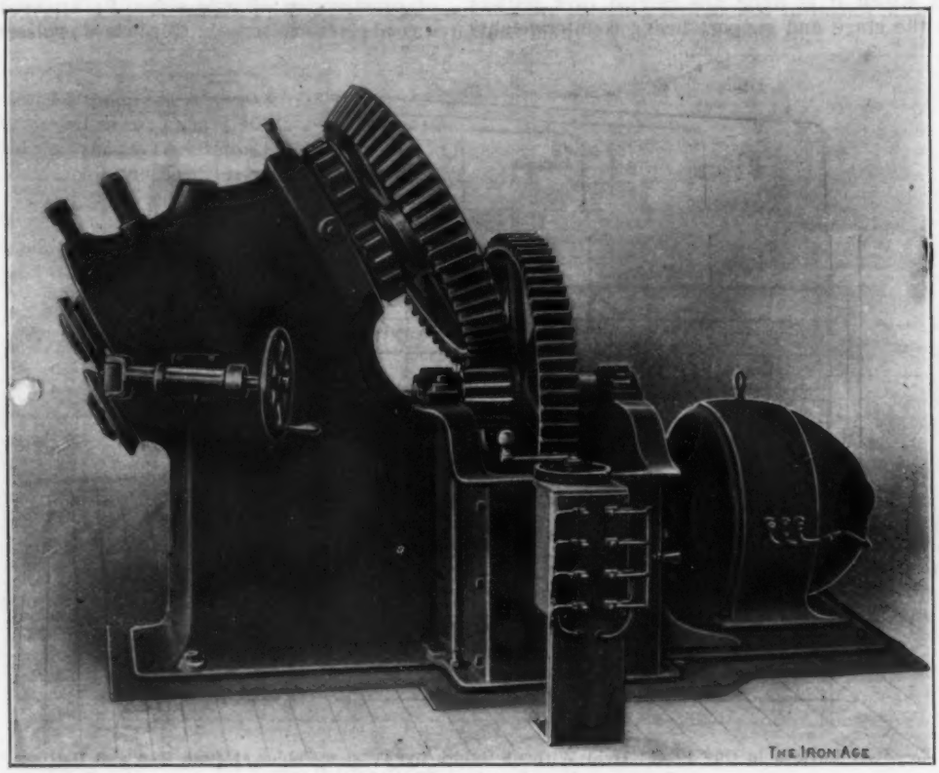
destroyers, 23; submarines, 11; river gunboats, 6. Total, 69 vessels. During the 12 months from April 1, 1904, to March 31, 1905, which is the official year of the British Government, 32 of these vessels will have been completed and passed into the navy. This addition will be composed of: Battle ships, 3; armored cruisers, 5; second-class cruisers, 1; third-class cruisers, 4; destroyers, 8; submarines, 10; river gunboats, 1.

B. M. Gardner, iron and steel broker, Room 541, The Rookery Building, Chicago, has been made sales agent in Chicago territory for the Pittsburgh Steel Foundry. They are manufacturers of steel castings from 50 pounds to 50 tons in size, and devote special attention to the manufacture of steel rolls, castings for mills, electrical work of special mixture, binding machinery and railroad work, and also make a general line of steel castings. They are also manufacturers of heavy ingots in acid steel for forging purposes. The capacity of the plant is 1500 tons per month.

Results of tests at the Massachusetts Institute of Technology on the heating values of various fuels are stated to be as follows: Anthracite coal, 15,000 to 16,000 B. T. U. per pound; bituminous coal, 14,000 to 15,000; coke, 10,000 to 14,000; hard wood, 8000 to 9000; charcoal, 12,000; peat, 10,000; coal peat briquettes, 10,000 to 13,000; kerosene, 20,000 to 25,000, and gasoline, 20,000 to 25,000, B. T. U. per pound.

A Bevel Shear with Motor Drive.

An interesting example of motor driving in connection with a rotary bevel shear is shown herewith. It illustrates a No. 2 Lennox bevel shear directly driven by a 7½ horse-power Crocker-Wheeler motor. As may be seen, the motor is placed on the floor back of the machine with the switches and starting box conveniently arranged, and may be geared or belted to the shearing apparatus, as preferred. The machine will bevel plates at a speed of 400 or 500 feet an hour up to and including ¾ inch in thickness. It is particularly adapted for beveling the outside of flanged heads or any irregularly shaped edges of plate running either inward or outward, and will also bevel the flanges of dome sheets before or after they are rolled or flanged. In operation the rotary blades revolve in opposite directions, holding and feeding the plate while they cut it, and as the knives will not receive the plate when it is too thick there is little danger of breaking or injuring them. This shear is now being used to quite an extent where the planer used to be the only machine practicable. Joseph T. Ryerson & Son of Chicago are the agents for the Lennox shear.



MOTOR DRIVE APPLIED TO A BEVEL SHEAR.

Turbines for Cunarders.

A London cablegram under date of March 27 states that great interest has been aroused by the announcement of the Cunard Company's decision to adopt turbines in the new fast steamers which are to be built under an agreement with His Majesty's Government, and which will have a gross tonnnage of 28,000 and are expected to travel at a speed of 25 knots an hour and cross the Atlantic in about five days.

It will be remembered that a committee was appointed last September to assist the directors in arriving at a definite conclusion. At the time of the formation of this committee a small amount only of information was available as to the relative economy of the turbine engine and the reciprocating engines doing similar duty and developing equal power. The work of the committee has been, therefore, largely experimental.

Two series of comparative tests have been carried out, one on shore, at the Neptune Bank station of the Newcastle-upon-Tyne Supply Company, and the other afloat, with the steam ships "Arundel" and "Brighton," on the Newhaven-Dieppe route. Both ashore and afloat the relative economy of the different types of engines was determined by the steam consumption per unit of power, and to obtain this tanks were fitted by means of which the condensed steam from the engines was accurately measured.

At the Neptune Bank the tests were made with reciprocating engines and turbine engines running at various proportions, the full power and full speed output of electricity being recorded in each case. The speed of the turbine engines fitted on shore is considerably higher tnan is permissible for those for marine purposes, where the speed of rotation is limited by considerations of propeller efficiency.

In view of this, although the experiments at the Neptune Bank were of great value, those carried out with the steamships were still more useful. The results obtained with the two steamships were exactly comparable, as the "Arundel" and the "Brighton" are practically sister vessels, the only difference being in the machinery, the "Brighton" having turbine engines and the "Arundel" reciprocating engines.

The two vessels were first run side by side from Newhaven to Dieppe and back, one of them being on the ordinary service, thus eliminating the possibility of errors due to the variations of weather and tide. Afterward, with the "Brighton" running at different speeds, tests were carried out in the Solent.

Not only have the directors of the Cunard Company had to give much consideration to the question of the adaption of turbines as against reciprocating engines, but the design and dimensions of the new ships also required much thought and attention. Most exhaustive and careful experiments have been made with regard to the best form for the ships, and every point in connection with their size and design in every detail has been gone over many times.

A hydraulic plant for the generation of electricity for lighting purposes will be established this season at Woodbury, Conn., where a large reservoir will be built to increase an existing water power. The town of Woodbury and the Pomeraug Valley will be lighted from this plant.

A New Surface Grinder.

In the accompanying illustrations is shown a machine, the purpose of which is to grind piston rings accurately and cheaply. In its design the manufacturers had especially in mind the needs of makers of small engines, such as gas or gasoline motors for automobiles and autolaunches, and they claim to have produced a grinder which will finish to a standard gauge 50 such piston rings an hour.

The work is held in the machine by a magnetic chuck mounted on a vertical spindle, which is adjusted by means of the hand wheel shown near the base, and, as the latter is graduated to thousandths of an inch, a micrometer setting is possible. The chuck is driven from a grooved cone pulley through a train of gearing within the machine body, as illustrated in Fig. 2. As the case is made carefully dust tight effective protection is provided for the gears, which improves their running qualities. There are eight steps on the driving and driven cone pulleys, affording an equal number of speeds and

Fig. 1.—The Working Side of the Tool.

allowing ample variation to suit various sizes of work. The grinding wheel is mounted on a cross slide which permits the wheel to travel to the center of the chuck, making it possible to grind thrust collars, disks, dies, &c., as well as piston rings.

The column of the machine is made in two parts, with the division just under the head, and by means of an adjusting screw at the rear the cross slide may be tilted for other than perfectly flat grinding—*i. e.*, to make the surface thicker or thinner at the center than at the outside circumference. Such an expedient may be desirable on many classes of work, as, for instance, metal slitting saws and similar cutters which need to be thinner at the center to provide clearance.

The half-tone engraving shows the machine fitted with hand feed for traversing the wheel to the work and back and forth across its face, but it is also fitted with automatic feed, as shown in the line drawing, so arranged that the wheel will advance to the center of the chuck and then return and stop, or else continue to reciprocate automatically until stopped by the operator. The automatic feed is transmitted by a worm gear, engaging a worm on the lower driving spindle, through a cone pulley and belt to a set of three bevel gears in the upper part of the column. Two of these gears are mounted on a sleeve on the feed spindle and are movable lengthwise, so that only one is in action at a time. They provide opposite directions of rotation and, being tripped by a mechanism actuated by the travel of the cross head, cause the reciprocation of the wheel. When it is desired to have the wheel stop at the end of a cycle (across the chuck and back), a stop is interposed which allows the sleeve with its bevel gears to travel but half the usual distance, leaving both disengaged from the driving gear.

The Walker magnetic chuck, with which the machine is equipped, is controlled by an ordinary electric snap switch, the work being held firmly in place when the current is applied and automatically released when the circuit is broken. Absolute rigidity of the work is required in grinding piston rings, and the difficulty of attaining this has been one of the obstacles in the way of securing the desired precision. Inasmuch as the fit of the piston rings is an important factor in the efficiency of an engine, it will be appreciated that a machine which will make them accurately and cheaply is greatly to be desired. The one described is made by the Heald Machine Company, Worcester, Mass.

The American Radiator Company's Litchfield Plant.—Ground will soon be broken for a large radiator plant for the American Radiator Company at Litchfield, Ill. The plant will comprise three buildings merged into one in an irregular L shape. The main foundry, with core rooms, &c., will cover a floor space of 132 x 425 feet; the machine shop, 97 x 160 feet, and the warehouse 121 x 301

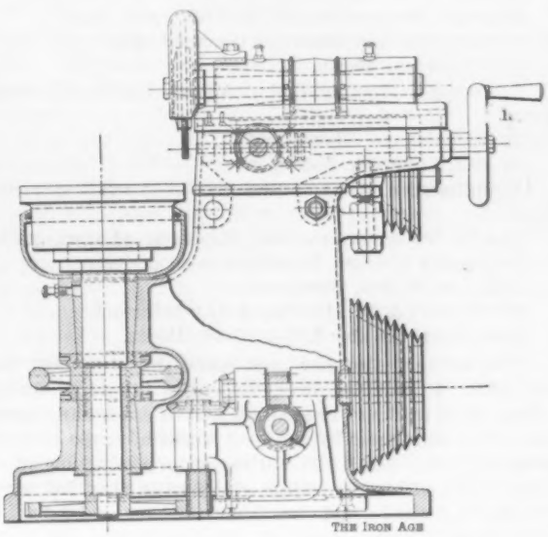


Fig. 2.—Detail of the Construction.

feet. But little new machinery will be bought for this plant, as the cupola, cranes and much other machinery will be moved there from other plants belonging to the company and the rest required will be largely special, built by the company on the ground. The power plant will consist of three 175 horse-power water tube boilers, not yet purchased, and a McIntosh & Seymour tandem compound engine belted to a 175-kw. generator. It will be housed in a separate building, 38 x 104 feet. The plant will employ about 500 hands.

Disturbances have arisen in the Department of the North, France, over the application of a new law making 10 hours the maximum for labor. The socialists thought that shorter hours would benefit the workingmen, but the workers throughout the district are organizing strikes, on the ground that they want more pay instead of less work. The employers offer to give the same wages for 10 hours as they have previously given for 10½ hours, but the employees decline to accept this and insist on higher wages for 10 hours than they received for 10½ hours. Much disorder has already occurred, and several small establishments have been sacked.

The German Steel Syndicate.

ESSEN, March 14, 1904.—The great German Steel Syndicate, which was looked upon as a failure when last I reported to you, has been arranged for after all, and with this the great uncertainty which has hung over the German iron and steel market for months has given way to a more hopeful sentiment.

On February 29 the following works came together as a joint stock company under the firm name of "Stahlwerksverband," with a capital of 400,000 marks:

Aachener Huetten-Aktienverein, Rothe Erde.
Bochumer Verein fuer Bergbau u. Gusstahlfabrikation, Bochum.
Burbacher Huette, Burbach a. d. Saar.
Deutsch-Luxemburgische Huettengesellschaft, Differdingen (Luxemburg).
Dillinger Huettenwerke, Dillingen, a. d. Saar.
Eisenhuetten-Aktienverein, Duedelingen (Luxemburg).
Eisenwerk Kraemer, St. Ingbert (Pfalz).
Eisenwerksgesellschaft Maximilianshuette, Rosenberg (Bavaria).
Eisen-und Stahlwerk Hoesch, Dortmund.
Georgs-Marien-Bergwerks-u. Huettenverein, Osnabrueck.
Gesellschaft fuer Stahlindustrie, Bochum.
Gewerkschaft Deutscher Kaiser, Bruckhausen a. Rhein.
Thyssen & Co., Muelheim a. d. Ruhr.
Gutehoffnungshuette, Oberhausen.
Hasper Eisen-und Stahlwerk, Haspe i. Westfalen.
Hoerder Bergwerks-und Huettenverein, Hoerde.
Koenigs-und Laurahuette, Oberschlesien.
Fried. Krupp, Essen.
Lothringer Huettenverein, Aumetz-Friede, Kneuttingen.
Friedenshuette, Oberschlesien.
Peiner Walzwerk, Peine.
Röchlingsche Eisen-u. Stahlwerke, Voelklingen a. d. Saar.
Rombacher Huettenwerke, Rombach (Lothringen).
Gebrueder Stumm, Neunkirchen a. d. Saar.
Akt. Ges. Union, Dortmund.
De Wendel & Co., Hayingen (Lothringen).
Gebrueder van der Zypen, Coeln-Deutz.

The arrangement has been made thus far until June 30, 1907. It includes, first, the entire inland production of the steel works of crude steel and of muck bar; second, the entire purchases by the steel works of crude steel and semiproducts; third, the entire home production of the steel works of blooms, billets, slabs, rails, ties, fish plates, tie plates for rails and ties, I-bars, U-bars and Z-bars, 80 mm. and upward, and of such articles which are rolled on the same trains as the articles enumerated; fourth, the entire home production of bars, hoops, wire rods, plates, tubes, axles, wheels, tires, forgings, steel castings, steel rolls, and all other manufactures not enumerated under No. 3 and No. 4, but made direct from the same crude steel. The steel works sell to the syndicate the entire products enumerated under 1, 2 and 3, the syndicate taking over the deliveries and the sale of these products. The lines enumerated under No. 4 are not sold to the syndicate, but each steel plant sells the same itself or through other associations.

Of the larger steel works, the Phœnix at Ruhrort and the Westfaelische Stahlwerke at Bochum are outside of the syndicate. Negotiations are pending with these works concerning the conditions under which they will join. We believe, however, that both of them will soon become members of the syndicate, which will then control about 89 per cent. of the total German steel production. The balance of 11 per cent. is made by smaller open hearth plants, with whom thus far there have been no negotiations whatever.

The total production of steel ingots, including Bessemer open hearth and crucible, is officially stated to have been 6,645,869 tons in 1900, 6,394,222 tons in 1901, 7,780,682 tons in 1902, and is estimated at 8,820,000 tons in 1903. The works which have already joined and the two which are expected to join aggregate 7,750,000 tons. Without the two the members would represent 83.5 per cent.

Thus far there has been determined the participation of the different works in the total steel product, in the steel purchased, and in the output of billets, track material and shapes. The total production of all finished materials has also been settled, an accounting being made only as to quantity.

The management is in the hands of a board and of an Executive Committee of eight, consisting of A. Kirdorf of Rothe Erde, Dr. Schmidt of Fr. Krupp, Aug. Thyssen of Deutscher Kaiser, L. Roechling of Saarbrucken, Dr. Meyer of Peine, Pastor of Zabrze, Upper Silesia; L. Grossberger of Aumetz-Friede and F. Lob of Hoesch. The chairman is A. Kirdorf.

The formation of the syndicate has had a beneficial influence upon the course of the German steel market. In the last few weeks, when it was a question of to be or not to be, the trade was greatly depressed, since no one was in a position to make any arrangements even for a few weeks. Demand has now set in along the whole line. Large contracts for beams, steel and for bars have been closed during the last week, and in other branches, too, there is more animation. Export orders have come in in fair volume, although it must be noted that the export in raw material and in semifinished materials is less this year than it was in 1903, which, however, cannot be designated as normal.

There has been little change since our last report in the ore situation. Swedish and Spanish ores have largely been purchased earlier in the year for the whole of 1904, and the contracts for Minette have still to run until July 1, so that there is no pressure to arrange for renewals of the same.

The pig iron business, both at home and for export, has been really active. Home prices are unchanged, at 67 to 68 marks for spiegeleisen; 56 marks for special mill iron, f.o.b. Siegen; 67.50 marks for No. 1, and 64.50 marks for No. 3 foundry iron; 68.50 marks for Bessemer pig; 52 marks for Luxemburg foundry iron, and 45 marks for Luxemburg mill iron, f.o.b. furnace. Basic Bessemer pig is quoted at 57.40 to 58 marks, delivered consuming steel works. In the foreign markets considerably lower prices must be made, owing to the competition by England. The competition of the United States is at the time being hardly felt in neutral markets.

In the steel market, which was held back more than any other before the formation of the syndicate, there has been an extraordinarily active business, and there are quite large inquiries for export also. Home prices remain unchanged, at 77.50 marks for ingots, 82.50 marks for blooms and heavy billets, 90 marks for 40 mm. square billets, and 92.50 marks for slabs.

Business has been extraordinarily active in bars at hardening prices. Ordinary steel bars are quoted at 112.50 marks and upward per ton, and success has been met in the efforts to secure higher prices for export throughout. There has been a considerably increased activity in other lines, like bands, sheets, rails and beams, while the tube market shows very little activity at the present time. The trade in wire and wire nails has suffered disturbances as the result of the Russo-Japanese war.

The railroad companies have never in their history been subjected to such heavy losses from various causes as during the past year. Their roads have been blockaded by flood and by snow, and an unusually severe winter has crippled their operations by disabling their motive power. Scarcely had they begun to recover from the rigorous winter when in many parts of the country they have found their operations seriously impeded by floods. The floods of the past week have devastated an immense area of this country, and important railroad systems have had their operations completely suspended for days at a time.

The Saco & Pittu Machine Shops, Biddeford, Me., have filled the places of the molders in their employ who recently struck on account of the change in method of paying for work done—from being paid by the day to piece work.

Metric Measurements in Manufactures and Engineering.

Henry R. Towne of the Yale & Towne Mfg. Company of Stamford, Conn., brought out some interesting points relative to the use of the metric system in this country in an argument made before the House Committee on Coinage, Weights and Measures. He spoke as follows with reference to

The Export Trade.

The argument is made that we need this change in order to foster our export trade. That trade is already vast and increasing, is of vital importance to the country, and, above all, to our manufacturing industries. Anything that would aid it is certainly worth most careful consideration. But in the judgment, I believe, of the great majority of those who are concerned in the export trade in manufactured products the abandonment of our present standard for the French standard of length would not only be of no benefit to us, but would impose a most serious handicap upon us.

The best evidence of this is that no demand for this change comes from those who are directly concerned in our export business. Since 1866 it has been permissible, under the laws of the country, for any one to use the metric system if he pleases, and transactions based upon it have been legal. Yet the mechanical industries of the country to-day are not using the metric system, I venture to say, in one-tenth of 1 per cent. of their operations. If there were this alleged benefit to be derived from it, why have not these industries voluntarily availed themselves of it? Indeed, they have rejected it.

The import trade of this country in manufactured products of other nations is vast. All of those products which come from continental Europe—that is, the major part—are made in countries using the metric system. How much has this fact retarded or interfered with our use and importation of the manufactures of those countries? Absolutely not an iota. Some manufacturers in those countries are so dependent upon our market that if their control of our market depended upon this question (that is, depended upon adapting their products to the standard of length in use here) they would promptly discard their own measures and use our measures. But do they do this? I am prepared to answer that question in the negative, after much reading and study of the subjects, and many visits to Europe, and inquiries among the industries of the countries there.

A Commission Suggested.

In concluding his argument Mr. Towne said:

What shall be done? If the committee cares for my opinion, it is this: The subject is a most important one. It is a proper one for the Government to deal with, and unquestionably there is room for some improvement in our present standards of weight and measures; but it is supremely a practical and technical question. In France it was dealt with by scientific commissions, one after another. In Germany it was dealt with by a large technical commission. In both cases 11 years were required by those commissions to do their work. What I hope your committee may decide to do is to draft a report recommending, and to introduce a bill for the creation of, a national commission on standard measures of length, weight and volume, and providing for the appointment on that commission of leading scientists, leading engineers, leading manufacturers—men versed in all the various phases of this question; and they are many. The commission so appointed should be authorized to make a report as to what, in the light of all the evidence it can collect, is the most expedient thing to be done with our national standards.

There are some of our measures which could be improved. I think our three measures of weight could be unified into one, with no disturbance. I think our measure of volume could be united into one and harmonized with the English system. Measures of weight and of volume relate practically to the present and the future. They have little to do with the past. But measures of length, in the language of one of the persons who has written on this subject, "are linked irrevocably to the past." You cannot obliterate them. You may compel manufacturers to submit to confusion where we now have uniformity, and to incur an enormous expense in duplicating their standards of length, but you cannot obliterate the existing system. "It is linked irrevocably to the past."

National Metal Trades Association Notes.

CINCINNATI, OHIO, March 28, 1904.—The strike of employees of the Fisher & Davis Company, St. Louis, has been declared off unconditionally. There was not a break made in the St. Louis Metal Trades Association on this account.

The Citizens' Alliance, Memphis, Tenn., has a very large and growing membership. From indications there will probably be no further attempts at violence.

The National Metal Trades Association is receiving all kinds of inquiries from college debating societies in reference to the labor question. These it answers at length and usually sends a copy of the *Bulletin* for further information. It often follows these up and usually finds that the anti-union side wins in about 98 cases out of 100.

The convention held in Philadelphia last week fully demonstrated one thing—namely, there is much duplication of work going on not only as between the national and local organizations, but also between national associations. Commissioner Du Brul has taken the matter in hand and, after investigating fully, will take steps to stop such duplication.

Summer School for Artisans.—We have received from F. E. Turneaure, dean of the College of Mechanics and Engineering, University of Wisconsin, Madison, Wis., a bulletin and notice of the Summer School for Artisans, which is held under the direction of the College of Engineering for a period of six weeks during the summer, beginning June 27. Three sessions of this school have already been held. The first, in 1901, formed a new departure in educational methods and was undertaken as an experiment, but its success fully justified the continuation of the school. In 1903 students came from 12 States, and among them were mechanics and engineers representing almost every branch of industry. The class instruction consists of lectures given by members of the regular faculty of the College of Engineering, and as the entire laboratory equipment of the college is available, opportunities are afforded for laboratory practice otherwise available only in a regular engineering course. To many men who cannot attend an engineering school, from lack of time, funds or other reasons, this summer course affords an opportunity for filling out their engineering education which they could not secure in any other way. To those who have been taking courses of instruction with the correspondence schools such a practical course as that offered at the University of Wisconsin will be particularly valuable. Courses of study are offered on the following subjects: First, steam, gas and other heat engines; second, applied electricity; third, mechanical drawing and machine design; fourth, materials of construction, fuel and lubricants; fifth, shop work, including practice on hand tools, wood and metal working machinery, and in blacksmithing and pattern making. The requirements for admission do not extend beyond a working knowledge of English and arithmetic. Further information in regard to the Summer School for Artisans will be sent those interested on application to Frederick E. Turneaure, dean of the College of Engineering, Madison, Wis.

A news dispatch from Muncie, Ind., states that a most determined crusade against unionism has begun in that city. Nearly 1000 workmen have become identified with the American Independent Mechanics, a new organization whose purpose is to make war on the unions. Almost every trade is represented. The specially important feature of this movement is that it has taken root in one of the strongholds of unionism. Up to a very recent date no locality in the country was more thoroughly unionized than the gas belt of Indiana, in which Muncie is located.

The Iron Age

New York, Thursday, March 31, 1904.

DAVID WILLIAMS COMPANY, - - - - - - - - PUBLISHERS.
CHARLES KIRCHHOFF, - - - - - - - - - EDITOR.
GEO. W. COPE, - - - - - - - - - - ASSOCIATE EDITOR.
RICHARD R. WILLIAMS, - - - - - - - - - HARDWARE EDITOR.

Dealing in Pig Iron Warrants.

Our readers are, of course, familiar with the general facts bearing upon the trade in pig iron warrants in Great Britain, which has been conducted for something like 60 years. A renewed effort is to be made to establish the system in this country. In another column will be found a report of the proceedings at a meeting held in this city for the purpose of formulating a plan of procedure. Attempts in this direction have been made several times. When the New York Metal Exchange was formed, some 20 years since, one of the purposes contemplated was dealing in pig iron by means of warrants. For a little time such transactions were recorded, but the project did not meet with sufficient favor to make it a prominent feature of exchange business. After the formation of the American Pig Iron Storage Warrant Company a great deal of energy was expended in endeavoring to bring about the use of that company's warrants by the iron trade in securing protection against an adverse change in the iron market during the life of long contracts. It was, however, found impossible to arouse interest in the matter sufficient to make even a beginning. The producers who needed money placed their iron in the storage yards and borrowed money on the warrants, but consumers were not disposed to deal in them. Possibly they might have done so to some extent if the warrants had been regularly quoted on an exchange, but they appeared to take no cognizance of warrant iron, except when pig iron became scarce and the stocks in storage yards proved inviting.

It is possible that the time may now be ripe for popularizing transactions in warrants. In the past the producers of pig iron have looked askance at the proposition to deal in warrants on an exchange, believing that it meant the injection of a speculative element in the iron trade which would not be productive of wholesome results. This sentiment, however, appears to have undergone a change, as shown by the encouragement now being given to the fresh attempt to establish dealings in warrants. It is stated that officers or managers of furnaces representing over half of the productive capacity of the merchant furnaces have expressed themselves favorably toward the warrant system. The movement also appears to be countenanced by reputable pig iron commission firms. While its success is not completely assured even by such backing, it must be admitted that the scheme has a much better chance to succeed than if these interests were arrayed against it in uncompromising hostility. The fact is certainly indicative that they are willing to see the experiment tried for what it may be worth. The iron trade has gone through some experiences wholly undreamt of at the time of the futile Metal Exchange dealings of the early 80's, and possibly the producers and merchants are less fearful of the trade being unfavorably affected by specuation than they were then. The country has undoubtedly become more habituated to speculative methods, and is therefore less inclined to regard them with abhorrence, possibly recognizing at the same time that some important commercial advantages may be realized.

Should the contemplated plan be carried through, and regular trading in warrants begin under the auspices of the New York Produce Exchange, it will very likely be found that more than one company will have warrants which are adapted to dealings of this character. Quite a number of companies are in existence in different parts of the country making advances on pig iron as well as other merchandise, and issuing negotiable warehouse receipts. Their receipts can be made conformable to the regulations of the exchange, and thus an opportunity may be offered for securing a wide range of brands or grades. It has happened in the past that some of the warehouse companies in the Northwest have carried in storage large quantities of charcoal pig iron. In some other sections Bessemer pig iron has been stored. The dealings in warrants would thus not be limited to ordinary foundry iron, but would embrace a greater variety of qualities. The methods adopted by the modern storage companies are also much more favorable for operations of this character than in the old days, when it was considered necessary to have iron stored on property actually owned by a storage company. The modern method is to lease a piece of ground in the immediate proximity of a furnace and store the pig iron there, so that light expense is involved in handling and no transportation charges accrue. The iron thus covereu by wararnts can be shipped as conveniently from the storage yard as from the furnace itself. An arrangement of this kind enables the stock of pig iron carried by a storage company to be as readily accessible by consumers as though it was in the possession of the producing company. Those who are now advocating the warrant system have made out a very strong case in favor of its introduction, and the result of their efforts to introduce it will be awaited with much interest.

The New Mexican Duties.

The advance in Mexican tariff rates, which goes into effect this week, is likely to cause a number of American manufacturers to establish branch factories there. Some announcements of this character have already been made. Mexico has developed into an important market, especially for mining and railway supplies, and those of our people who have built up an extensive trade across our Southern border are not disposed to view with indifference its diminution or possible loss. Mexican industries, it is true, have not yet expanded to the point of supplying the requirements of the country, and it may take years for them to come anywhere near doing so. The augmented tariff may therefore prove more of a revenue measure for the benefit of the Mexican Government than a bar to the admission of foreign made products, but unquestionably if maintained it will stimulate Mexican manufactures. Branches of American manufacturing concerns which are now locating there will have the advantage of participating in the growth of the country's domestic trade, and will maintain a business connection with this country which will probably be advantageous to related interests.

The Mexican situation almost parallels that of Canada, the difference being that the latter country not only maintains high duties on most manufactured products, but also discriminates in favor of Great Britain. Numerous American manufacturers have established branch factories in Canada, and the movement has by no means ended, rather important developments of this character having very recently been announced. It may be assumed that in both of these border countries American capital will continue to be invested as long as the Govern-

ment is stable and the investment appears reasonably safe. In the case of Canada, however, notwithstanding the vigorous growth of home manufactures, a good market is still found for American merchandise. The consumption of the country appears to grow apace as its resources are more thoroughly developed and new areas are opened to settlement and cultivation. Possibly the same future is in store for Mexico. In any event, the raising of the tariff duties is hardly to be regarded as an immediate cause of serious uneasiness.

National Expenditure.

In his speech in Congress drawing attention to the rapidly increasing expenditures of all the leading nations, Representative Burton gave their military and naval expenditures for last year, but not for an earlier year, a comparison with which would have shown to how great an extent the armies and navies account for the increase in the total cost of government. The figures for 1898, however, are easily supplied, those for the United States being the appropriations for the fiscal year, made before the war with Spain, and therefore very slightly affected by that event. That year is selected partly because it affords a five-year comparison, and partly because it was the year previous to the Hague Conference called by the Czar to devise some means of limiting the growth of military expenditure. This was not attained, but the Conference created a tribunal for the settlement of controversies without war, which it was hoped would abate the pressure for greater armies and navies. This comparison, then, will show how much effect the Hague Conference has had on the costs of armaments.

In round numbers, the United States and six nations of Europe spent $894,000,000 on their troops and fleets in 1898, and $1,360,000,000 last year, an increase of $466,000,000, or more than 52 per cent. Mr. Burton's argument that while national expenditure is increasing faster than population, it is not increasing faster than wealth, may be true enough for a considerable term of years, but it is certainly not true of military expenditure in the last five years. A good deal more than one-half of this total increase, about $260,000,000, was made by Great Britain, which had in the meanwhile fought the South African war at a cost of about a billion dollars, and this war may have had some effect upon last year's expenditures in spite of the fact that it closed at the end of May, 1902.

The next largest increase is our own, a round $100,000,000, or nearly 150 per cent. The Russian increase was $51,000,000, or a little under 30 per cent. Germany's increase was $20,000,000; France's, $13,000,000; Italy's, $12,000,000, and that of Austria-Hungary, $10,000,000. One hesitates to say that this rate of increase cannot go on, partly because it is so obvious that it does not need to be said, and partly that finance ministers have been saying this so long that it has been discredited. The capacity of peoples to bear increased taxation has astonished ministers and delighted kings, who are constantly demanding greater armies and navies. But in spite of the failures of prophecy, one may venture to say that an increase of military expenditure of more than 50 per cent. in five years cannot be repeated frequently, though there seems to be little limit to the borrowing capacity of governments so long as taxation will pay the interest. We may yet expect financiers to propose frankly that money for the interest shall be borrowed, as it has been in emergencies, and that taxation should only be expected to meet the interest on interest.

Mr. Burton spoke with much force of the evils of distributing financial power and responsibility, as is done in Congress, a subject to which attention was recently called in these columns. He reminded the House that the appropriation bills were taken away from the Ways and Means Committee in 1865, and in recent years more than half the bills had been taken away from the Appropriations Committee. No one person or committee revises the estimates for all branches of the Government, and each committee consults only with the official concerned in spending the money which it is proposing to appropriate. He warned the House that such a system, or lack of system, could not fail to promote extravagance. As the expenditure is increasing faster than the revenue, and has already so nearly reached the present and prospective income of the Government that radical measures have to be taken to avoid a deficit, and as new taxation in a period of peace and prosperity would not be very welcome, Mr. Burton's admonitions regarding the distribution of appropriation bills may prepare the way for a change. Congress, however, will not concentrate power in one committee till driven to it by stern necessity.

When the House passed the last general appropriation bill, Mr. Hemenway, chairman of the Appropriations Committee, who warned the House in January that a deficit of $42,000,000 was impending, imparted the cheerful information that there was a prospect of a surplus of $42,000,000 in the next fiscal year. But this result was not achieved by a general scaling down of the costs of government. Some of the appropriation bills exceeded the estimates, and others fell but little short of them. Economy was effected by omitting the River and Harbor bill and by deferring many of the expenditures for public buildings and for river and harbor improvements which have already been authorized. The requirements of the army and navy were met by heavy cuts in appropriations of a commercial character.

CORRESPONDENCE.

The Metric System in England.

To the Editor: I beg to call your attention to what I believe is an error in your issue of March 10, in the letter on "The British Iron Trade." Under date of February 27, 1904, the correspondent states that

"On Tuesday afternoon last (February 23) the House of Lords unanimously passed the bill rendering compulsory the use of the metric weights and measures in Great Britain. The bill provides that the metric system shall become compulsory on April 5, 1906, or at such later date as may be directed by an Order in Council."

The London *Times* publishes Parliamentary proceedings in considerable detail, and on February 24 I find in that journal that the House of Lords after discussing the metric bill passed it to a second reading, and then against the wishes of Lord Kelvin, a supporter of the bill, referred it to a Select Committee. On March 1 the committee was announced to be composed of Lords Belhaven, Colchester, Wolverton, Kelvin and Farrer. On March 5 Lord Addington was added to the committee. I have watched every issue of the London *Times* from that time to March 15, and have found no reference to a report having been made by that committee. I assume that your London correspondent mistook the passage to the second reading for the passage of the bill, whereas the former is a rather perfunctory proceeding which is sometimes adopted even when the final defeat of the bill is certain.

I trust you will make a correction of the error, as it will lead many in this country to conclude that the metric system is about to become compulsory in Great Britain.

It has already misled the editor of the *American Machinist*, who inserted an item in a recent issue based, as I understand, upon your London letter.

Yours very truly, SAMUEL S. DALE,
Editor *Textile World Record.*

BOSTON, MASS., March 25, 1904.

Scientific Shop Management.*

BY HENRY L. GANTT, SCHENECTADY, N. Y.

Most manufacturers are perfectly willing to pay extra high wages if by doing so they can get the full output of their plants. Many do pay high wages, yet only a few get even approximately as much work done as should be done, and the problem before us all is to find out why we cannot buy the necessary amount of labor if we are willing to pay full price for it.

Buying labor is one of the most important operations in modern manufacturing, yet it is one that is given the least amount of study. Most shops have expert financiers, expert designers, expert salesmen and expert purchasing agents—for everything except labor. The buying of labor is usually left to people whose special work is something else, with the result that it is usually done in a manner that is very unsatisfactory to buyer and seller.

It is admitted to be the hardest problem we have to face in manufacturing to-day, and yet it is only considered when the manager "has time" or has "to take time," or on account of "labor trouble."

The time to study this subject is not when labor trouble is brewing, but when things are running smoothly and employer and workman have confidence in each other.

While men prefer, as a rule, to sell their time, and themselves determine the amount of work they will do in that time, a very large number of them are willing to do any reasonable amount of work the employer may specify in that time, provided only they are shown how it can be done and paid a substantial additional amount of money for doing it. The additional amount needed to make men do as much as they can depends upon how hard or disagreeable the work is, and varies from 20 to 100 per cent. of their day rate.

If the work is light and the workman is not physically tired at the end of the day, he will follow instructions and do all the work called for if he can earn from 20 to 30 per cent. in addition to the usual day's wages.

If the work is severe and he is physically tired at the end of the day, he requires from 40 to 60 per cent. additional to make him do his work.

If, in addition to being physically tired, he has been obliged to work under disagreeable conditions or in intense heat, he may require 60 or even 100 per cent. additional. As example of the three kinds I may cite the following:

Light Work.—Inspecting, counting, handling light objects.

Heavy Work.—Running machine tools, handling pig iron, shoveling, &c.

Heavy and Disagreeable Work.—Smith or hammer work, work around furnaces in gas house, rolling mills &c.

If we wish to buy the amount of labor needed to accomplish a certain task, we must first find out exactly and in detail the best method of doing the work, and then how many hours' labor of a man suited to the task working at his best normal rate and by the methods prescribed are needed to perform it.

This is simply getting up a set of specifications for the labor we wish to buy, and is directly comparable to a set of specifications for a machine or a machine tool.

The relative importance of buying labor and machinery according to best knowledge we can get and the best specifications we can devise is best illustrated by the fact that while the purchase price of a machine may be changed wherever a new one is bought, that of the labor needed to do a piece of work should be practically permanent when it is once fixed.

Knowing exactly the work to be done and the conditions under which labor is for sale, the purchase of the proper amount of labor is simply a financial transaction, and it is comparatively of little importance whether that transaction takes the form of day work, piece work, differential piece work or task work with a bonus.

In fact, each of these different forms of contract seems to have its special place. The significance of the terms differential piece work and task work with a bonus, however, is that they cannot be applied without a clear knowledge of the labor that is to be bought. In order to get this knowledge a very large amount of careful study must be given to the details of each problem by men who are trained to the work. Until a man has had a large amount of practical experience in this study his results are always inaccurate.

It is a pretty easy job to keep a record of how many tons of pig iron an ordinary laborer will load into a freight car per day when paid by the day for his labor, but it is not an easy task to find out how many a good man suited to the job can load. This problem has been solved, and the ratio is about 1 to 3½.

The same ratio holds good for shoveling coal, sand, gravel, &c.

These facts were found out by a detailed study of the labor needed, and have been confirmed by experience.

To explain what is meant by a detailed study of labor, we will suppose we are studying the art of shoveling. The conditions that enter into the problem are: Size of shovel, time to fill shovel, time to empty shovel, time needed for rest.

Size of Shovel.—The shovel should hold the full weight a good strong laborer can throw conveniently. This has been determined, and in any kind of shoveling the size of the shovel should be such as will hold the proper weight of the material handled.

Time to Fill Shovel.—The time to fill a shovel depends upon the material and the conditions under which the shovel is filled.

The easiest conditions under which a shovel can be filled are from the base of a pile of material resting on a hard floor.

If the material is fine and homogeneous it is but little more difficult and hence takes but little more time to fill the shovel if the workman is on top of the pile; but if the material is irregular or lumpy, like coal, or packs tightly, like broken stone, the difference in time between shoveling from the top or bottom of the pile is very great.

Time to Empty Shovel.—Time to empty shovel does not vary so much, except in the case of materials that stick to it. The time, however, needed to make a long or high throw and bring the shovel back to the proper position for filling is substantially greater than that needed if the throw is a small one.

Rest.—If a man fills and empties his shovel continuously without losing any time between operations he will need to stop occasionally for rest. It is a question to determine what proportion of the time a good man suited to the work needs for rest.

Having determined the time needed to fill and empty a shovel under any set of conditions, we can figure how many shovelfuls he can throw per minute, and, knowing the weight his shovel will hold, we can find the weight he can shovel per minute.

To keep this up we must allow him the proper proportion of time for rest, and, making the proper allowance, we can calculate what he should do per hour.

When proper study of this character has been made, the results of this method of fixing pay for work done are absolutely reliable.

In fixing the pay for this work, we may make a piece rate which will enable a good man to make 50 per cent. in addition to his day's rate if he does the amount of work indicated; or we may indicate the proper amount to be done in a day and give him a bonus of 50 per cent. if he does all, a smaller bonus if he does a definite fraction of it, and his day's rate only if he falls below that fraction. This in outline is the method of handling an ordinary labor problem.

The Machine Shop.

There are many ways of handling a machining operation, but I will cite only the two extreme cases with which I am familiar:

1. The foreman gives it to the first available man who has a machine capable of doing it, with but little consideration as to whether it can be done economically on that machine or not. He gives few, if any, instructions, and the workman sets out to hunt up holding devices such as

* Read at the Philadelphia meeting of the National Metal Trades Association, March, 1904.

he thinks proper for the work. Having secured these he sets the work carefully and slowly, and then takes up the question of cutting tools, which certainly need to be ground and frequently to be forged.

Having secured a good tool, which he does not wish to spoil, he starts his machine at a good steady speed and a small feed. A large feed would certainly make his belt slip and might spoil his tool, and his education has taught him not to take chances. He gets the job done in the long run, and it is usually well done.

2. The other extreme is where the work is given to the best expert machinist available, who has at hand slide rules embodying the laws of cutting metals and their application to each of the machine tools in the shop. Knowing approximately the properties of the metal to be cut, he can determine in a few minutes the most economical combination of feed and speed for doing the work on the available tools, and hence the time needed for doing it. From previous study of the details of setting or holding, the work is most economical.

Having satisfied himself on these points, he makes out a detailed set of instructions for setting the work and for doing each of the machine operations, giving the shape of tool, kind of tool steel, combination of cut feed and speed for each, with the time needed for each and the total time for the job.

The piece to be operated upon and all the appliances needed are gotten to the machine while it is still running on the previous job, so that no more time may be lost than is needed to change the work in the machine. The workman is given a substantial bonus in addition to his day's wages, amounting to from 30 to 50 per cent. of his day's wages, if he does the work in the time set, but only his day's rate if he takes more than the time allowed.

The result of this is that in a very short time most of the workmen will be glad to give up their old haphazard methods and follow instructions in order to get the increase of pay.

The ratio of the time taken to do the same piece of work under the two sets of conditions I have described is seldom less than 5 to 1.

I have, of course, taken extreme cases, and there are all degrees of day work, premium and piece work between the two, but even under the best forms of premium and old fashioned piece work the time needed is usually at least double that needed if a thorough knowledge of the laws of cutting metals and doing work is brought to bear on the subject.

Mr. Taylor, who was the pioneer in this work, has been at it for 20 years, and I have been at it for 15 years, yet the man who has given the subject two hours' study is, as a rule, fully prepared to improve on the methods that have been developed. His improvements invariably consist in trying some short method that to him looks promising, and which, I can assure you, looked the same way to us several years ago. Many blind leads were followed and short cuts taken before it was clearly established that such methods did not pay, for they gave results that were always short of the maximum, and we never knew how much short they were until a complete investigation often showed that they were less than 50 per cent. of that maximum.

The results of the substitution of this type of management, in which all work is done by the best method that the experts can devise and at the best speed a man fitted to it can work, for the ordinary one when the method of doing the work is decided by the workman, or at best by a busy foreman, is that the output of many plants is doubled, and that of others increased in a higher ratio.

The conclusions to be drawn from the above facts are:

1. Don't increase the size of your plant to get an increased output until you have made a scientific study of the capacity of the plant you have.

2. The profit to be derived from increasing the output of your present plant is so much greater than that to be obtained from getting the same increase of output from a larger plant that no possible means of getting it from your present plant should be left untried.

3. While doubling the size of your plant seldom doubles your output unless you very materially modify your methods of management, and never more than doubles your profits, the expenditure of one-third of the money needed to do this in installing a thoroughly scientific system of management with modern equipment in your plant will almost surely more than double its output, and increase your profits 200 per cent.

4. The art of scientific management is so new that few people know its possibilities.

The policy of most plants is controlled by a man who has had his main experience in either the engineering or financial department.

The superintendent who was formerly the engineer usually has the engineering portion of his plant in good shape, often at the expense of the financial and operating departments.

In the same way a financier who has become the manager is apt not to appreciate to their full value the engineering or operating details.

In fact, if a half dozen of the best managers in this room were called upon to decide upon the best policy throughout for a plant, there is but little doubt that there would be more differences of opinion. Such men are all successful and hence must in a more or less degree be logical, and should draw the same conclusion from the same facts. Inasmuch as they apparently do not, the natural supposition is that they do not see the facts in the same light; in other words, the facts as a rule are not clear.

The first object of the work advocated is to find out exactly what the facts are by the only safe method known, that of scientific investigation. Having done this and put them in such a shape that they cannot be misunderstood, the conclusions to be drawn will vary but little the one from the other, and competent managers will be in substantial accord as to the policy to be pursued.

The world's production of gold for the year 1903 showed a substantial increase both in the number of ounces of refined gold mined and in the total value. The record of the United States was less favorable than the other countries, for the reason that the strikes in the Cripple Creek and in other mining sections seriously interfered with production. The production in this country amounted to 3,600,331 ounces, as compared with 3,870,000 ounces in 1902. The value was $74,425,340, as compared with $80,000,000 in 1902. The other gold producing countries showed a total output for the year of 12,294,210 ounces, as compared with 10,567,669 in 1902. The value of the output was $254,143,434, as compared with $218,452,606 in 1902.

A. W. Gibbs of Altoona, Pa., general superintendent of motor power of the Pennsylvania Railroad, reports that the riser from the thermit weld of the steel frame of an engine was drawn out under the hammer into a bar some 3 feet long and turned down and broken. The test showed an elongation of 21.5 per cent in 8 inches, and the tensile strength was 91,600 pounds per square inch. The analysis of the metal was as follows: Carbon, 0.102; manganese, 2.330; phosphorus, 0.070; silicon, 1.227, and sulphur, 0.034 per cent. The engine the frame of which was repaired with thermit on February 20 has been on the road since, from the latest advices. The thermit used for this weld had in it a mixture of 2 per cent. of pure managanese free from carbon and 5 per cent. of iron punchings.

Contracts for 100,000 tons of coal for the City Hall, Halsted street bridge and the water and sewage pumping stations, to cost $300,000, have been let by the Commissioner of Public Works, Chicago. It is said that the price ranged from 5 to 10 cents a ton lower than in 1903. The following are the successful bidders for the water stations' supply: Busse Coal Company, Miami Coal Company, Edgewater Coal Company, Dearborn Coal Company and Scully-Kostner Coal Company. The Dearborn firm secured the contract for the supply to the sewage pump stations.

The axle works department of the Ansted Spring & Axle Works, at Connersville, Ind., were destroyed by fire on the 28th inst.

Engineers Visit the Frank-Kneeland Works.

Upon invitation of the United Engineering & Foundry Company, the Engineers' Society of Western Pennsylvania and others, to the number of about 150, paid a visit on Wednesday evening, March 23, to the company's Frank-Kneeland Works, at Fifty-fourth street and Allegheny Valley Railway, Pittsburgh. This plant is the largest individual works owned by the United Engineering & Foundry Company, and has recently been considerably enlarged. It embraces a foundry, machine shop, erecting shop, pattern storage building, &c., and is one of the most complete plants in the country for the manufacture of heavy rolling mill machinery of all kinds.

Description of the Plant.

The foundry is a steel building, covered with corrugated iron, and is 100 x 280 feet, with a lean-to 30 x 80 feet. It is commanded by four electric traveling cranes, two of 20 tons capacity, one of 5 tons and one of 3 tons. It contains three air furnaces and one cupola, the melting capacity being 125 tons daily. In one day recently 128 tons were melted. The machine shop is of brick and steel construction, 100 x 220 feet in size. It is 30 feet high to the rail end, and is commanded by two 20-ton electric traveling cranes. Every tool in the shop is motor driven, the larger tools having independent motors. The shop contains 42 iron working tools of various kinds, some of them being of very heavy construction.

The erecting shop is a model building, having been completed only last fall, being 75 feet wide, 212 feet long and 35 feet to the top of the crane runway. It is equipped with two Shaw electric traveling cranes, one of 50 tons capacity, the other of 12 tons, each equipped with an auxiliary hoist of 6 tons capacity. The building is of steel and brick construction, and special attention was paid to ventilation and light. It has a lean-to containing a storeroom of two floors, machine shop, office, tool room and men's lavatory. The heating system is underground, the heat being forced through terra cotta pipes, distributed to the building at each bay through an outlet. Exhaust steam is used for heating, the fan being motor driven. The heating arrangements are so perfect that a temperature of 60 degrees can be maintained in the coldest weather.

The power house is a brick and steel building, 20 x 38 feet, and is equipped with two 150 horse-power Harrisburg standard engines, direct connected to Westinghouse generators; also a 25 horse-power Westinghouse compound engine, direct connected to a Bullock generator, and a 35 horse-power gas engine, direct connected to a Westinghouse generator. The last is used for extra and Sunday work only. The pattern shop is located on the gallery floor of the machine shop, and contains a full line of wood working and pattern making machinery.

Work on the Floor.

The visitors were conducted through the plant by G. W. Knotts, assistant manager, and Frank I. Ellis, assistant engineer, and were very much impressed with the amount of heavy work on the floor, about ready for shipment. Included in this was a three-cylinder hydraulic shear, capable of cutting 4-inch by 4-inch billets up to hot ingots 10 inches by 30 inches. The stroke is 16 inch, and has a specially designed stop, driven by an electric motor, which regulates the quantity of water used, making the shear one of the most economical built. The valves are so arranged that only the central cylinder need be used on small billets, the two outer ones on medium work, and the three cylinders on the maximum work of the shear. The base, triple cylinder, cross head and ram are steel castings, the main columns being forged steel, the cylinder moving on bronze liners. The shear is capable of exerting a pressure of 500 tons, and has a total weight of 74 tons. The shear is equipped with hold downs on front, which are arranged to work automatically, and are a very efficient device, suiting all thicknesses of materials without requiring any special adjustment of the blades.

There was also noticed a 60-inch extra heavy motor driven plate shear, capable of cutting 3-inch by 60-inch plates cold. The housings of this shear are air furnace cast iron, and weigh 60,000 pounds each. The gearing is all cast steel, the motor gears and second gears being cut, all gears having involute teeth and designed especially heavy. The main shaft is 18 inches in diameter, of forged steel, weighing 14,000 pounds, and planed square at the crab fit, the latter being operated by outside packed hydraulic cylinders, supported on extra heavy brackets. The top knife head is cast iron, and weighs about 15,000 pounds, and is fitted with a hydraulic balance. The bottom knife head is also cast iron, and has a wedge adjustment for setting out the knife. The knives are of a very high grade of steel, and are reinforced by cast steel knife seats. The whole shear rests on a very substantial cast iron base plate, and is self contained, driven by a 100 horse-power A. C. 2000-volt motor, geared to give the shear about fifteen cuts per minute. The total weight of the shear is 270,000 pounds.

A piece of machinery that attracted special attention was a 40-inch blooming mill, designed and built by the United Engineering & Foundry Company for the Illinois Steel Company, Chicago. This mill is to roll beam blanks and 4-inch billets, and the rolls in place, when the mill was inspected, were of cast steel, and weigh 28,000 pounds each. The screws are of a very high carbon, 11 inches in diameter, 1¾ pitch, and are driven by an electric screwdown on a new design, operated by a 75 horse-power series wound motor, with magnetic brake, the speed of the lift being about 10 feet per minute, and the extreme opening 30 inches with 30-inch rolls, which are balanced by hydraulic cylinders under constant line pressure. The housings are made of a special mixture of air furnace iron, and each roll housing weighs 86,000 pounds. The shoes on the bed are also made especially heavy, weighing 2100 pounds per lineal foot, with a total length of 45 feet 7 inches and a total weight of 192,000 pounds. The pinions for driving the mill are steel castings with staggered teeth, 40 inches P. D., and the pinion housings, fillings and pinions have a total weight of 197,000 pounds. The driving crab is a very substantial construction, weighing complete 15 tons, and the whole will be driven by a pair of 55 x 60 reversing engines, direct connected. The total length of the mill is 53 feet; its extreme hight above foundations is 20 feet, and the total weight is 860,000 pounds. The roll tables on this mill are 300 feet long.

Another notable piece of work was a 42-inch single cylinder hydraulic intermediate shear, capable of cutting 18 inches square hot. The shear will be hooked on the 40-inch blooming mill for the Illinois Steel Company. Other heavy pieces of machinery were a 60-inch shear for a slabbing mill, and another built from the same patterns with a 132-inch knife. This shear is for the Dominion Iron & Steel Company, Sydney, Nova Scotia, Canada, for whom the United Engineering & Foundry Company are also furnishing plate mills and tables complete. For the new tube mills of the National Tube Company, at Lorain, the company are furnishing a large amount of equipment. Included in this are racks and rails for welding and bending rolls; large bending rails for bending lap weld pipe; five 44-inch roll lathes, motor driven, with variable speed, and two 18-inch roll lathes, also motor driven and with variable speed. During the visit a flashlight picture of the guests was taken, and after the shops had been thoroughly visited a light luncheon was served.

The Canadian Rubber Company of Montreal recently remodeled their power plant and found that the tall brick chimney, 110 feet high, would not give the proper amount of draft necessary in connection with the four new Stirling boilers they were to install. Mechanical draft was necessary, and for this purpose a large Sturtevant steel plate fan, driven by a Sturtevant horizontal engine, was installed, and now the proper amount of draft is easily obtained and regulated at will, regardless of the weather conditions.

At Pittsburgh the name of Virgin Alley, one of the prominent thoroughfares of that city, has been changed to Oliver avenue, in honor of Henry W. Oliver, deceased. Mr. Oliver owned a good deal of property on this thoroughfare, and it was widened largely through his efforts.

MANUFACTURING.

Iron and Steel.

The Riter-Conley Mfg. Company, Pittsburgh, builders of heavy steel construction of all kinds, have recently taken some important contracts. Among these is a large extension to the buildings of the West Virginia Pulp & Paper Company, Piedmont, W. Va.. About 1000 tons of steel will be required for this work. The company have also received a contract for a large extension to the plant of the Midvale Steel Company, made necessary by their contract for furnishing armor plate to the Government. This contract will require about 2000 tons of steel and the work will cost about $170,000. The frame work of the buildings will be unusually heavy, in order to accommodate 150-ton cranes which will command the new building.

The plant of the American Bridge Company, at East Berlin, Conn., has been closed down temporarily, the reason, it is stated, being lack of orders.

The Humbert Works of the American Sheet & Tin Plate Company, at Connellsville, Pa., which have been idle for some months, will be started this week. The plant contains six hot and six cold mills.

The plant and property of the Alabama Tube & Iron Company, at Helena, Ala., is being offered for sale by trustee, the Birmingham Trust & Savings Company of Birmingham, Ala., who will receive bids until April 30. The plant has a capacity of 75 tons of iron pipe per day.

The plant of the Ward-Dickey Steel Company, which is in process of construction at Indiana Harbor, Ind., is now very nearly completed and within the course of a week or ten days operations will be ready to begin. A portion of the machinery is already in and the remaining equipment is being installed as rapidly as possible.

A new concern known as the Robinson Iron & Steel Company have been organized at Scottdale, Pa. It is said the new company will erect a plant for the manufacture of high grade iron bars by a secret process invented by Richard Robinson of Pittsburgh.

The Empire Iron & Steel Company, Reading, Pa., have one furnace in operation and another ready to go into blast. The Temple, Emaus and Leesport furnaces have been running for some time.

The Lackawanna Steel Company are making extensive repairs to their idle plants at Cornwall, Pa.

One of the Thomas Iron Company's stacks at Alburtis Pa., has resumed operations. Another is to go into operation at Hellertown, Pa.

Fire will be started within a few days in Keystone Furnace of the Reading Iron Company, Reading, Pa.

The Pennsylvania Steel Company, Steelton, Pa., last week put in operation their No. 1 blast furnace. No. 3 is still out of blast, but will be blown in shortly. Nos. 2 and 4 and Lochiel blast furnaces are producing to their capacity daily.

The force of workmen engaged in the enlargement and improvement of the mills of the Eastern Steel Company at Pottsville, Pa., has been increased. The bridge shops are working on a large contract.

The Laughlin Works of the American Tin Plate Company, at Martin's Ferry, Ohio, have resumed operations in full. The plant was idle for a few days because of the strike of the screw boys, who have since decided to go to work pending official announcement of the vote on the Amalgamated wage scale reduction.

General Machinery.

The business of the Quintard Iron Works, foot of Twelfth street, East River, New York, has been incorporated under the same name. No change in management or business is contemplated.

The New York, New Haven & Hartford Railroad Company announce that beginning April 1 their shops, including those at Readville, Mass., will go on a ten-hour schedule. At present an eight-hour schedule is in force.

The National Separator & Machine Company, Manchester, N. H., manufacturers of turret sensitive drills, have taken part of the shop building of the Concord Machine Company, Concord, N. H., and will remove the business there immediately. Their new quarters will give the National Separator & Machine Company considerably increased facilities.

W. H. Baker, Des Moines, Iowa, formerly with the Iowa Machinery & Supply Company, has sold out his interest in that company and opened a new business at 206 Court avenue under the name of the Baker Machinery Company. The Baker Company will manufacture freight and passenger elevators and deal in all kinds of power transmission goods, engineers' supplies, steam and power pumps, and iron pipe and fittings.

Brink & Washer, recently organized by J. H. Brink and R. G. Washer, have taken over the plant and business of J. R. Rand & Co., Brattleboro, Vt. The new firm will do general machine work and will manufacture speed lathes, screw machines, breast drills, countersinks for wood or steel, hangers, &c.

The Hartford Mill Company, Hartford, Ky., are in the market for machinery for the manufacture of doors, sash, &c.

The Standard Machinery Company, Providence, R. I., manufacturers of jewelers' machinery, screw machines and roller bearings, will establish a branch in Buffalo on May 1, having leased space in the Hamilton Building from that date.

Edward Sellers, Oak Hall, Pa., manufacturer of agricultural implements, is in the market for a power punch for the new machine shop he is fitting up. Later on it is his intention to purchase a few other machines. Most of the equipment has already been bought, including a 26-inch wood planer, mortiser, band saw, cut off saw, circular saw, hand jointer and 8-foot bending rolls.

Beaudry & Co., Boston, Mass., report that recent orders for their Champion power hammer include the Baltimore & Ohio Railroad, Canadian Pacific Railroad, Seaboard Air Line, Grand Rapids & Indiana Railroad and the Indianapolis & Northwestern Traction Company. Their export trade has been good, a number of orders having been placed in Great Britain and on the Continent, including hammers for several French automobile manufacturers.

It is understood that the Williams Typewriter Company, Ansonia, Conn., will make considerable additions to their machine equipment this spring.

The Murray Company, Dallas, Texas, manufacturers of cotton gin supplies, have plans nearly completed for extensive additions to their plant. The structures to be erected are foundry iron machine shop, wood machine shop and planing mill, tin shop, power house and office building. A great deal of new machinery will be installed. J. H. Donough is president of the Murray Company and Fred. J. Baker secretary and treasurer.

The C. O. Bartlett & Snow Company, Cleveland, Ohio, report that their business is rather quiet just at present, but there are a large number of inquiries for cement machinery. The Baltimore fire has occasioned an increased demand for cement, due largely to the fine showing made by the concrete work in buildings that went through the fire, while throughout the South a number of cement plants are to be erected to supply material for the Panama Canal. The company are installing coal dust fueling outfits in the plants of the Iroquois Portland Cement Company, Caledonia, N. Y., and the Northwestern Malleable Iron Works, Milwaukee. Tests of their coal dust fueling apparatus recently made at the plant of the McCormack Harvester Company showed a saving of 25 per cent. over the cost of coal.

The Peter Geriach Company, Cleveland, Ohio, manufacturers of barrel machinery, report that their business is heavier than ever before in their history. This is due largely to the increased demand for oil, cement and flour barrels. They state that a great change has been taking place in the cooperage business during the past two years. Larger concerns have been taking up the work and the small cooper shops have been giving way to plants equipped with modern machinery. The Geriach Company are supplying a long felt want in the production of a cylinder stave sawing machine which permits the utilizing of small timber heretofore practically valueless for stave and barrel work. A large number of cooperage concerns are being formed to work up the small timber in districts where the larger growth has all been cut out, and, on the whole, it is stated that the cooperage business is expanding in an unprecedented manner.

Power Plant Equipment.

The Franklin Machine Tool Company, Franklin, Pa., who recently took over the property of the Grant Tool Company of that place, are manufacturing Shepherd engines, Hutchinson elevators or moving stairways, rock drills, &c. They advise us they have quite a number of orders for these products.

The Town Board of Cicero, Ind., has granted an electric light franchise for 25 years to John Plain of Noblesville, Ind. A new plant will be built.

The business of the Model Gas Engine Company, Auburn, Ind., which was recently placed in the hands of a receiver, is to be continued practically the same as in the past. It is understood that the assets are greatly in excess of the liabilities and that everything will be cleared up satisfactorily within a short time. The company were doing a more extensive business than their capital would permit them, requiring considerable borrowed money, and the receivership was made necessary because of the recent failure of banks from whom the company had borrowed. The annual invoice, taken February 1, just prior to the receivership, showed assets of $293,000 and total liabilities outside of stock of $101,000, $90,000 being indebted to banks.

The Corinth Engine & Boiler Works, Corinth, Miss., organized some months ago, have completed plans for their new plant, which will consist of a foundry, 60 x 150 feet; machine shop, 75 x 150 feet; boiler shop, 75 x 150 feet; pattern shop, 40 x 75 feet; warehouse, 40 x 100 feet, and office building, 30 x 60 feet. The buildings will be constructed of brick and will be modernly

equipped. The machinery that will be required for the present has been arranged for. J. E. Creary is president.

The Water Board of New Orleans, La., will receive bids until May 10 for two 90 horse-power gasoline engines and two centrifugal pumps, with motors. Geo. G. Earl is general superintendent and F. S. Shields secretary.

The White Engineering Company, Marion, Ohio, have been formed with $25,000 capital stock by H. J. Cobbold, J. F. McNeal, Henry White, L. B. McNeal and John White. They will manufacture valve gears and portable air engines and will establish a factory in that city.

Foundries.

The Palatka Iron & Brass Foundry, Chris Stanton, proprietor, Palatka, Fla., has been incorporated as the Stanton Foundry & Machinery Company. The new company have decided to consolidate their foundry and machine shop, which are now located at different points, and for this purpose they have purchased 210 feet of property adjoining their machine shop, where they will erect a new foundry, 50 x 150 feet, and a pattern shop, 50 x 70 feet. The company make iron, brass and bronze castings, fittings, boilers and gas engines. They also contemplate operating a marine railroad and making a specialty of repairing yachts, launches, &c. Chris Stanton is president and H. M. De Montmollin is secretary and treasurer.

The Penn Steel Casting Company of Chester, Pa., laid off last week about 50 hands for several weeks on account of a scarcity of orders, it is stated.

The damage done recently by the fire at the plant of the Solid Steel Casting Company, Chester, Pa., has been overcome by the erection of new buildings, which are almost ready for use. A large extension has been made to the chipping shop and a 5-ton traveling crane has been installed.

Within the next 30 days the Francis & Nygren Foundry Company, 549 West Fifteenth street, Chicago, will move to their new plant, now nearing completion at Filmore street near Rockwell. The new plant will consist of foundry, 100 x 140 feet, and separate buildings for office and storage of patterns. The capacity of the plant will be increased to more than treble its present output. The company make a specialty of castings for ice machines, their entire output being confined to semi-steel.

The Rock River Mfg. Company, Dixon, Ill., who were recently incorporated at $50,000 to do a general foundry business and also to manufacture tubular steel wheels, automobile wheels, &c., will soon have their plant ready for manufacturing operations. All of the machinery is on the ground and will be installed immediately.

The Nassau Smelting & Refining Company have made application to have the Henry McShane Mfg. Company, Baltimore, Md., declared bankrupt. The petition states that the McShane Company owe $250,000 and are insolvent, and that by going into the hands of receivers they committed an act of bankruptcy. The petitioners oppose a proposed reorganization of the company and want the business wound up. The McShane Company were for years the leading bell casting concern in the country.

The Schneider & Trenkamp division of the American Stove Company, Cleveland, Ohio, will erect a new foundry building at their works, at Case avenue and Pennsylvania tracks. Contract for the building has been placed with L. Dautel & Sons, Cleveland.

The Columbia Foundry Company will locate at New Richmond, Ohio, the citizens of that place having raised the bonus necessary to secure the location of the plant. The company will erect a foundry, 80 x 125 feet, with a boiler room adjoining.

Bridges and Buildings.

The double track bridge which the New York, New Haven & Hartford Railroad Company planned to span the Connecticut River at Saybrook, Conn., is now assured, Congress having granted the necessary authority.

The Memphis Bridge Company, Memphis, Tenn., organized last fall with a capital stock of $50,000, have broken ground for their large plant in New South Memphis, which they expect to have completed and ready for operation about June 1. The product will be bridge and structural steel work. The equipment has been purchased.

J. B. C. Lockwood, Portland, Ore., has received contract for a steel bridge over Balch's Gulch, on Thurman street. The bridge is to be 400 feet long by 40 feet wide and have a capacity of 5400 pounds per lineal foot live load. The contract price was $29,384.

Williams Brothers & Morse, Cleveland, Ohio, have received the general contract for the construction of four railway bridges at Newton Falls, Ohio, for the Baltimore & Ohio Railroad Company. The contract amounts to $35,000. The company are engaged on a $35,000 contract for the Big Four at Weisburg, Ind., and on a $275,000 contract for the Wabash at New Alexandria, Ohio.

Fires.

The main foundry of the Tacony Iron Works, Philadelphia, Pa., was burned March 23. The loss is estimated at $50,000.

On March 19 the car department of the Santa Fe Railroad shops, at Albuquerque, N. M., was destroyed by fire.

A recent fire did $10,000 damage to the machine shops of C. J. Weinman & Co., Dayton, Ohio.

The Gates & Edwards Gas Engine Company's plant, Lansing, Mich., was destroyed by fire March 25, causing a loss of $20,000.

F. C. Otto & Sons' music box factory, Jersey City, N. J., was destroyed by fire March 26. The loss is about $50,000.

The machine shops of the Pittsburgh Valve, Foundry & Construction Company, Pittsburgh, Pa., were destroyed by fire March 29, causing a loss of probably $200,000.

Hardware.

The Automatic Screen Company, Grand Rapids, Mich., have incorporated with a capital stock of $100,000, three-fourths of which is paid in. The company have been manufacturing for some little time and now have salesmen in nine different States.

The Spring Steel Fence Company of Anderson, Ind., have just added two fence making machines to their equipment, making a total of 15 machines now in operation. They have a capacity of 40 miles of 5-foot fence per day, and are pushing their plant to its utmost capacity. They make what is known as the Shimer woven field fence. W. S. Poling is general manager of the plant.

The Wright Wire Company, Worcester and Palmer, Mass., have been compelled by rush of business to put night gangs on in several departments.

Pennsylvania Woven Wire Company, Lock Haven, Pa., have been incorporated with a capital of $125,000. R. Worth Fredericks is president and Reese Kintzing secretary and treasurer. The company will manufacture wire cloth and other wire articles. The main building will be 95 x 255 feet, the boiler house 25 x 50 feet, and the warehouse 50 x 100 feet, with railroad siding connecting with the Pennsylvania Railroad. One hundred looms will be installed along with the latest improved auxiliary machinery. The work of erecting the buildings and installing machinery is being pushed as rapidly as possible, and wire cloth will be put on the market for this season's demand.

The Corlett Engineering Company, Cleveland, Ohio, have completed the plans and are closing the contracts for the erection of the plant of the United States Hardware Mfg. Company, at Port Clinton, Ohio. The plans call for the immediate erection of five buildings, as follows: Carpenter shop and shipping department, 50 x 250 feet; annealing room, 115 x 200 feet; two foundries, each 70 x 200 feet, and core shop, 30 x 70 feet. As soon as these are completed a power house, finishing shop and office building will be erected. The United States Hardware Mfg. Company were organized a short time ago to manufacture harness hardware specialties. They secured an attractive bonus and site from the Board of Trade of Port Clinton, which is on the main line of the Lake Shore & Michigan Southern Railway, a few miles from Sandusky.

Miscellaneous.

A copartnership has been formed between Frederick E. Haselbart, formerly connected with De Noon Brothers Paint & Glass Company, Pittsburgh, and John S. Edgar, formerly of the Eagle Paint & Varnish Company, Allegheny, to represent the Wisconsin Graphite Company of Pittsburgh throughout Allegheny County. The offices of the firm are in room 407, Arrott Building, Pittsburgh.

The Duncan Meter Company, Lafayette, Ind., have secured the contract for what is said to be the largest electric meter ever built. It will register 42,000 16 candle-power incandescent lights. It is for the new Chicago post office.

The Johnston Frog & Switch Works, at Chester, Pa., are preparing to build a large extension to their plant, which will be a one-story structure, with a heavy truss roof, in dimensions 60 x 150 feet. It will lie west of the main building and be parallel to the main shops. It will be used as an erecting department for the large switches and crossings, which heretofore have been assembled in the open, at times causing many delays in bad weather.

The Composite Brick Mfg. Company, New Haven, Conn., will erect a new plant on the Quinnipiac River to produce 50,000 bricks a day. The main building will be 80 x 186 feet.

The International Telephone Mfg. Company, Chicago, have recently added to their machinery equipment by the installation of a number of large presses and full automatic Brown & Sharpe screw machines.

C. R. Smith and W. P. Whitcomb, Montpelier, Vt., have organized the Enterprise Company and have purchased a small plant in which they are manufacturing vending machines.

The Hill Motor Car Company, Haverhill, Mass., have organized to manufacture automobiles. They are at present located in a small though well equipped shop, but it is their intention to very soon install a larger plant. George S. Hill is president; Nicholas C. Johnson, vice-president; Henry E. Guptill, treasurer, and A. Shirley Ladd, secretary.

The American Asbestos Company, Terre Haute, Ind., will have their mills, located at Bedford City, Va., in operation by April 15. The company are capitalized at $1,000,000 and own

about 5000 acres of asbestos and mica lands in the State of Virginia, chiefly in Bedford County. They will furnish white amphibole and all forms of the low grade asbestos, including asbestos sand of both white and dark colors. The product under their new patents will be free from all grit and tailings. They claim to be the only miners and millers of pure white asbestos of the amphibole grade in the United States. Their white amphibole as they fiberize it can be classified as paper stock and as such is in much demand in the European market. Their lower grade is of use for building purposes, such as cements, roofing paints, filler, fire proof brick, tiling, &c. Their fiber is said to be lighter in weight than any other on the market. As quickly as their sales department is organized they will establish offices in the larger cities.

The plant of the United States Tube Company, Buffalo, N. Y., has been sold to George Timmins of Syracuse at foreclosure sale, the Buffalo Loan, Trust & Safe Deposit Company, who held a mortgage for $35,000, having forced the sale.

The Kaester Mfg. Company have bought the plant of the Miller Knob Lock Electric Company, South Bend, Ind., which the purchasers will use for the manufacture of automobile supplies. The Knob Lock Company will build a larger plant in another part of the city.

The Bridgeport Crucible Company, Bridgeport, Conn., are to greatly increase their plant this season by the erection of a two-story building, 35 x 128 feet. A portion of the new space will be given over to manufacturing and the remainder will be used for storage and for a packing room.

The International Power Vehicle Company, Stamford, Conn. are planning to double their large plant, though the fulfillment of the plan this season is not yet a certainty. A new two-story brick building will be 50 x 250 feet and will be devoted to the manufacture of engines. The present factory will be given a brick addition 20 x 60 feet, and will be occupied for the building of launches.

The Studebaker Automobile Company, South Bend, Ind., have been incorporated with $100,000 capital to manufacture gasoline machines. The Studebaker wagon plant has been manufacturing electric automobiles, but this line will be confined hereafter to machines for hauling.

The Kiler Motor Mfg. Company, Indianapolis, Ind., have been incorporated with $25,000 capital by E. N. Hill, Chas. M. Kiler, H. O. Winter, W. B. Hill and E. J. Drumm.

The Titusville, Pa., plant of the American Radiator Company is working full time, and its shipments exceed those of any previous spring of the year in the company's history.

The Pope Motor Car Company, Toledo, Ohio, have received a cable order from Japan for ten of their four-cylinder gasoline automobiles. It is thought that they are to be used by officers in the Japanese army. The Pope company are employing 900 men and are unable to keep up with orders.

The Sterling Piano Company of Derby, Conn., are planning to make considerable extensions to their plant, that being one of the purposes of a recent increase in capital stock.

F. L. Robbins, M. H. Taylor and W. R. Woodford of Pittsburgh are applying for a New Jersey charter for the Pittsburgh Coal Car Company, with a capital of $100,000. It will be one of the underlying concerns of the Pittsburgh Coal Company and will own the rolling stock now operated by that company. The organization is being made so as to make more compact the mortgage that will secure the new bond issue and will make no change in the affairs of the Pittsburgh Coal Company.

The American Sand Lime Brick Company, Chicago and Anderson, Ind., are now erecting plants for making brick from lime and sand, as follows: Pensacola Brick Company, Pensacola, Fla.; Fremont Pressed Brick & Mfg. Company, Fremont, Ohio; King-Crown Plaster Company, Cedar Rapids, Iowa; Union Sand Lime Stone Company, Lafayette, Ind. More than half a dozen other plants of this character have recently been completed and are in operation. Brick is made as described in our issue of January 28, from a mixture of sand and lime without burning, hardening being done in 12 hours in a steam cylinder.

The J. I. Case Threshing Machine Company, Racine, Wis., have increased their capital stock from $1,000,000 to $2,000,000. The additional stock has all been paid in and will be used for largely increasing the business.

John Weber of Chicago has installed two Weber Perfect Combustion and Smokeless furnaces for the Prospect Dye Works, 1120-1132 Moss street, Reading, Pa.

The Quaker City Rubber Company, Philadelphia, Pa., have taken out a permit for their proposed new plant. The building will be 60 x 201 feet, of brick, two stories, and will have wings, 38 x 90 feet and 40 x 125 feet.

The Buffalo Box Factory, Buffalo, N. Y., recently destroyed by fire, is to be rebuilt upon a new site having a frontage of 592 feet on the Pennsylvania Railroad. The buildings will be fire proof, the main building 100 x 300 feet and four stories in hight, with basement. New machinery will be installed throughout, including an electric power plant.

On account of the conditions in the building trades in New York, the National Fire Proofing Company, Pittsburgh, Pa., have issued orders closing six of their plants—one in Perth Amboy, N. J.; two in Woodbridge Township; one at Keyport; one at Sandy Run, Pa., and one at Port Murray, N. J.

The Pittsburgh Writing Machine Company, Pittsburgh, Pa., have secured a large contract for typewriting machines for use by the Russian War Department.

The Stevens Organ & Piano Company, Marietta, Ohio, will erect a factory addition, 50 x 100 feet, and four stories high. They will install considerable steel and wood working machinery.

The Mahoning Motor Car Company, Youngstown, Ohio, have been formed, with L. E. Cochrane, president; D. E. Webster, secretary, and W. P. Williamson, treasurer and general manager. In conjunction with the Youngstown Carriage & Mfg. Company they will manufacture gasoline automobiles. A machine shop will be fitted up at once. Charles T. Gaither, formerly with the Fredonia Mfg. Company, automobile builders, will have charge of the mechanical end of the business.

The Petersburg Galvanized Iron Works, recently organized at Petersburg, Ind., with a capital stock of $10,000, to manufacture eaves trough and conductor pipe, have elected the following officers: President, W. A. Braden; vice-president, W. E. Williams; secretary, Marshall Williams; treasurer, John H. Viehe; manager, George M. Bohnert.

The Pressed Steel Car Company, Pittsburgh, have received an order from the Niles Boiler Works of Niles, Ohio, for 15 steel freight cars.

It is most amusing to read dispatches in the daily press making announcement of the discovery of a means by which the Elkins law is evaded. This law prohibits railroad companies from paying rebates to shippers. The discovery announced is that a favorite plan of evasion is to construct a switching track, give it a high sounding title, and pay switching charges, which are stated to have amounted in some cases to $15 a car. Enormous rebates are said to have been paid to shippers by means of this device. The amusing part of this statement is that it is heralded as a discovery. It has really been in operation since a very few months after the passage of the Elkins law, and its existence has been a matter of frequent comment.

A difficulty has been found in California in transporting the heavy oils of the Kern River Valley. A pipe line was recently finished from Bakersfield to a point on San Francisco Bay—a distance of 280 miles—with pumping engines 10 miles apart. When the line was opened, however, it took the thick Kern oil five days to travel 37 miles, and there was every prospect that a still longer time would be taken to pass through the next 37. Heating the thick oil to 120 degrees is to be tried, and the number of pumping stations is to be doubled.

During an electrical storm last summer lightning struck and ignited a 30,000-barrel tank of crude oil near Findlay, Ohio. About ¼ mile away from the tank was a leak of gas under a boiler, there being no fire under the boiler. When the destructive flash that fired the tank came, there was a puff, and flames were seen under the boiler. It seems that there must have been a spark which ignited the escaping gas under the boiler fully ¼ mile from the place where the lightning struck.

McKinley Lodge, Amalgamated Association of Steel & Tin Plate Workers, Elwood, Ind., all hot mill men and numbering 500, have decided to quit work rather than accept the 20 per cent. reduction in wages proposed by the American Sheet Steel & Tin Plate Company and indorsed by the officers of the Amalgamated Association.

At New Castle, Pa., the men in the lodges of the Amalgamated Association employed in the tin plate mills in the Greer and Shenango works of the American Sheet & Tin Plate Company have voted to accept the reduction of 20 per cent. in wages which went into effect on March 21. At South Sharon, Pa., the men in the lodge of the Amalgamated Association have voted not to accept the reduction in wages.

Judge Anderson of the Federal Court, Indianapolis, has dismissed the case of the Columbia Wire Company against the Kokomo Wire & Nail Company for damages for infringement on patents on a barb wire machine.

Trade Publications.

Iron and Brass Pipe and Fittings.—A revised copy of the illustrated catalogue and price-list of the Eaton, Cole & Burnham Company, 253 Broadway, New York, has just been issued for 1904. It is cloth bound, about 9 x 12 inches in size, and contains over 300 pages. All kinds of steam, gas and water supplies are covered under the following rough classification: Pipe and boiler tubes; iron pipe fittings; iron body valves; iron body work other than valves; brass valves; brass work other than valves, including plumbers' brass work; pipe machines and tools, and miscellaneous goods. The book is admirably indexed, a fact which deserves special mention, as so many otherwise valuable catalogues are rendered almost useless for reference purposes by the insufficient indexing. The points of the new catalogue to which attention is particularly called are the changed appearance of many of the styles and the increase in the variety of goods offered, partly due to new uses and adaptations of older types of goods and increased steam pressures.

Blowers, Engines, Motors, Generating Sets, Forges and Steam Heating Apparatus are described in catalogue No. 115, from the B. F. Sturtevant Company, Boston, Mass. It is a condensed catalogue, intended to cover all of the product which this firm manufacture in more compact form than the various 30 special separate catalogues previously issued. It is of a shape particularly adapted for desk use, being about 4 x 9 inches, and will fit nicely in a pigeonhole. On the inside front cover is given a summary of the other Sturtevant publications, so that the reader may know how to request more complete data on the subject he is particularly interested in. The illustrations are nearly all wood cuts of small dimensions to make room for a fair accompaniment of text matter.

Hoisting Engines and Mining Machinery.—The Lake Shore Engine Works, Marquette, Mich., are distributing catalogue No. 5, on hoisting engines, rock crushers, ore cars, ore skips, cages, rope sheaves and general mining requisites. Illustrations are given of the several articles, with descriptions of their salient features; also tables of dimensions of machinery and useful data on the strength of wire rope, and notes on hydraulics, air and steam. The preface directs attention to the fact that the equipment of the works is specially adapted for contract foundry and machine shop work, manufacturing machinery or apparatus to submitted designs, or specializing their own standard machinery to suit the particular requirements of the customer.

Electrical Machinery.—Under date of March, 1904, the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., are distributing circular No. 1077, on the subject of type L motors, series wound for direct current, and 1078, on the Westinghouse No. 91 single phase railway motor and car equipment. The first is an elaborate exposition of the motor, with illustrations and applications, diagrams, tables of dimensions and numerous curves from tests of the various sizes. The second circular will be of special interest at this time on account of the increasing use of alternating current in electric traction.

Gas Producers.—The American Furnace & Machine Company, Pittsburgh, Pa., have recently issued a catalogue on a water seal gas producer, bell coal hopper, water seal gas valve, a special grate and a smokeless boiler setting, as manufactured under patents of James H. and J. D. Swindell. The illustrations are line drawings showing the construction, and are accompanied with exhaustive descriptions.

Boilers.—The Wheeler vertical water tube boilers are described in an artistically illustrated catalogue, 9 x 12 inches in size, from W. W. Shilling, Sharon, Pa., sole agent. Following the history and description, with sectional views showing the construction of the boiler and its particular features, are a score or more of full page photo engravings of notable installations. The boiler is made in a form specially arranged for the utilization of blast furnace gas, and its use in this connection is the theme of most of the illustrations.

Electric Controlling Panels.—Bulletin No. 4367 from the General Electric Company, Schenectady, N. Y., superseding bulletin No. 4312, deals with fuse plug cabinet panels for two and three wire systems. The construction of typical outfits is followed by a discussion of the detail parts and illustrations of various sizes and forms for different numbers of branch circuits, dimensions, tables and price-list being given with each. Bulletin No. 4368 is on the subject of continuous current motor controlling panels. These are made in three classes; class 1 for constant or variable speed motors on a two-wire circuit, ranging from 3 to 15 horse-power at 125 volts, 3 to 25 horse-power at 250 volts and 3 to 50 horse-power at 550 volts; class 2 comprises panels for variable speed motors on a three-wire circuit, ranging in capacity from 2½ to 20 horse-power at 125 to 250 volts; class 3 comprises panels for constant speed motors on a two-wire circuit, in capacities of 5, 10 and 15 horse-power at 125, 250 and 550 volts, respectively. The parts entering into a complete outfit, including circuit breakers, switches, fuses, starting rheostats, &c., are separately described, and connection diagrams for the three classes are appended. A supplement to supply catalogue No. 7569, superseding pages 6 and 7, lists expulsion fuse blocks in both the ordinary and spring forms.

Metal Protecting Paints.—"A Second Review of Technical Paints for the Protection of Metal Surfaces" is the subject of a booklet from the National Paint Works, Williamsport, Pa. It gives tests and results obtained from the many forms of paint which this concern manufacture for metal protection, and is altogether an able discussion of a much mooted subject. The information it contains will be of special interest to engineers and contractors in the field of structural steel work.

Fan Motors.—The Emerson Electric Mfg. Company, St. Louis, Mo., have issued recently catalogue No. 2660 on Emerson fan motors for alternating current, and No. 2670 on Trojan alternating motors. The first deals with desk, bracket, ceiling, column and exhaust fans for low frequency and high frequency alternating current and exhaust fans for direct current. The desk and bracket fans are made with swivel base and swivel trunnion supports for directing the air current in any direction, and are equipped with fans of 12 to 16 inches in diameter. The ceiling and column fans are of the two and four blade pattern. The exhaust fans are of the direct connected type, and may be had with either Parker or Davidson blades. The Trojan fans, as described in the second catalogue, are made for high and low frequencies, in fan, bracket and ceiling form. They lack some of the special features of the Emerson and are sold at a lower price in large quantities.

Attrition Mills, Crushers, Pulverizers.—The American steel cake breakers and attrition mills, for crushing and grinding cotton seed, linseed cake, cake from all oil bearing seeds, also for grinding cotton seed hulls, rice hulls, oat and buckwheat hulls, tobacco stems, glue and gelatine, soap and soap powders, white lead, litharge, barytes, feathers, resin, &c., are described in a catalogue from the American Engineering Company, Springfield, Ohio. The machines are the design of J. F. Winchell, the manager of the company, and are the outcome of some three years' work in this field. They claim to embody many features not to be found in older forms and are described to considerable detail in the booklet.

Motors and Dynamos.—The Northern Electrical Mfg. Company, Madison, Wis., have recently issued bulletin No. 35 and a series of 16 leaflets. The bulletin contains 36 pages, profusely illustrated, with parts of the various types of the motor, their application to machine tools and their drive. The motors are divided into seven classes—the spherical, vertical, universal, ring type, steel box crane type, grinder and back geared motor. Among the leaflets there are six on Northern motors in metal working. The motor is shown in leaflet No. 113 applied to a 16-inch Ideal lathe; in 118 to a Northern die grinder and a hydraulic press; 119, to a vertical and a horizontal Brown & Sharpe milling machine; 123, to a Gisholt turret lathe and Gisholt tool grinder; 124, to a Bardons and Oliver turret lathe; 126, to a Logemann Bros. shaft straightening lathe and a crane trolley and hoist. Leaflet No. 114 shows the motor applied to a Coffin sluice valve; 122, to a Moline elevator; 125, in pumping service, direct connected to Deming, Gould and Quincy triplex, Baldwinsville and Gould centrifugal, and propeller pumps and bringing in gear, belt and direct connections. The Northern dynamos are shown in leaflet No. 128, direct connected to a Ball compound engine and an Alfree engine. No. 111-A shows one connected to a Racine vertical engine; 120, to a Bayley vertical engine; 121, to a National gas engine; 129, to a Root & Van der Voort engine. Leaflet No. 117 is a historical note contrasting a primitive Hindoo grinder, a grindstone driven by a dog treadmill, and the latest form of Northern electric grinder.

Air Compressors for Automobiles, Motor Driven.—Air compressors, especially in their use for inflating automobile tires and blowing dust from the cushions, are described in an attractively illustrated booklet from N. A. Christensen, Herman Building, Milwaukee, Wis. It shows an old acquaintance in a new guise.

NOTES.

The Automatic Machine Company, Bridgeport, Conn., are distributing an advance circular of an automatic threading lathe, accompanied by a "Shop Dialogue" representing a lathe in conversation with a milling machine and intended to bring out the features which, it is claimed, adapt the lathe to work heretofore confined to milling machines.

The Piano Division of the International Harvester Company, Chicago, has introduced Vol. 1, No. 1, of the *Piano Harvester News*, which is uniform in size with the *Deering Farm Journal*, and the *McCormick Farmers' Advance*, formerly newspaper size, has also been made the same standard size, 9 x 12 inches. All three are published by the International Harvester Company.

H. S. Vrooman, Eighteenth place and Sangamon street, Chicago, has issued a little booklet entitled "A Treatise on Molding Sand," for the purpose of drawing notice to foundry facing, foundry supplies and fire brick, which he is prepared to furnish to the trade.

The Dodge Mfg. Company, 43 Dey street, New York City, have issued a circular under date of March 20, 1904, on the spbject of standardization in the line of power transmission machinery. It contrasts with past conditions the conditions of to-day in the facility with which pulleys, hangers, &c., can be obtained on short notice, and in the great advantage of interchangeability when repairs are needed.

Morrison & Kennedy, Erie County Bank Building, Buffalo, N. Y., have prepared a folder containing letters of recommendation from users of their chimney valves, and a list of some of the furnaces that are now equipped with them.

The S. A. Woods Machine Company, Boston, Mass., are distributing a circular of their No. 221 new automatic knife grinder with power feed. It is sent out with a circular letter soliciting inquiries and mentioning a few of their other specialties.

The J. A. Fay & Egan Company, Cincinnati, Ohio, in Vol. 3, No. 32, list a number of second-hand tools for wood working purposes.

The Iron and Metal Trades

The meeting of the Lake Ore interests, which was to be held on the 1st prox., has been postponed until next week, it being impossible for some of the principal representatives to be present. The developments during the past week may be regarded as favorable to the reaching of an understanding, but it is still very doubtful whether any arrangement can be arrived at.

Southern Iron makers, well filled as they are with orders until well toward July, have been taking a moderate additional tonnage on the basis of $10 for No. 2 Foundry, Birmingham. Some occasional sales, however, are still being made at $9.75. It is the Northern makers who have been taking a relatively larger amount of orders lately, the whole market being decidedly firmer both on Foundry and Forge Pig Iron.

The whole Eastern Iron trade is watching with keen interest the developments in the placing of the contracts for Castings for the Pennsylvania tunnel. It appears that not only the contractors but the Pennsylvania Railroad, too, are asking for bids. As yet only the two river sections, calling for 52,000 tons and 120,000 tons, respectively, are involved. Some low prices are being talked of.

In the Cast Iron Pipe trade St. Louis is looming up as a very large prospective buyer. It is stated that the total requirements for plans under development will be 100,000 tons. Of this the first lot, involving 11,000 tons, has been placed with an independent shop in the Birmingham district.

From Cincinnati comes the report that specifications will soon be out for between 50,000 and 60,000 tons of Cast Pipe.

All this shows that consumption is likely to be heavier than at first anticipated, which, after all, is the most important factor, because it promises betterment, irrespective of the operations of any individual producing interests, be they large or small.

Bessemer Pig in the Central West is firm, and the product is being taken freely. Next week will decide whether the option on 40,000 tons additional metal will be availed of by the United States Steel Corporation.

Quite a tonnage of Low Phosphorus Pig Iron, aggregating at least 10,000 tons, has been sold by furnacemen in Eastern Pennsylvania to casting plants, for delivery in one case as far as Ohio and in another case as far as the Boston district. The sales have been at prices equivalent to $18.25 and $18.75, Philadelphia.

In the aggregate quite a large tonnage of Basic Pig has been placed lately in Eastern Pennsylvania, and the leading Steel works have nearly covered their requirements to the beginning of July at prices between $13.75 and $14, delivered. The movement has not led to any appreciable advance, therefore, but it is believed that the additional tonnage needed for the second quarter, some of which is now under negotiation, may bring about somewhat higher figures.

From the Central West come indications that the requirements for Iron and Steel on the part of the agricultural implement manufacturers and of the wagon builders are to be larger than expected, which is favorable to a series of groups of Iron makers.

The car and locomotive builders are getting occasional good orders, and the prospect is brighter in that direction. In Structural Material the more favorable outlook is clouded by the attitude of labor in this city.

Although no official information is available, it looks as though the Tin Plate workers have voted against the proposed reduction in wages. This, however, is not likely to seriously influence either the demand for raw material or the supply of product.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Mar.30, 1904.	Mar.23, 1904.	Mar.2, 1904.	April 1, 1903.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	**$15.00**	$15.00	$14.50	$22.25
Foundry Pig No. 2, Southern, Cincinnati	**12.50**	12.50	11.25	20.25
Foundry Pig No. 2, Local, Chicago	**14.00**	14.00	13.25	22.50
Bessemer Pig, Pittsburgh	**14.35**	14.10	13.85	21.85
Gray Forge, Pittsburgh	**13.25**	13.35	13.00	20.75
Lake Superior Charcoal, Chicago	15.25	14.75	15.25	26.00
BILLETS, RAILS, &c.:				
Steel Billets, Pittsburgh	23.00	23.00	23.00	30.00
Steel Billets, Philadelphia	**25.00**	25.00	24.25	29.00
Steel Billets, Chicago	24.00	24.00	24.00	31.50
Wire Rods, Pittsburgh	**31.00**	31.00	30.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	11.50	11.50	11.50	18.50
O. Steel Rails, Philadelphia	**15.00**	15.00	14.00	21.25
O. Iron Rails, Chicago	*16.50*	16.50	17.00	24.50
O. Iron Rails, Philadelphia	**18.50**	18.00	15.00	24.50
O. Car Wheels, Chicago	14.50	14.50	14.50	24.00
O. Car Wheels, Philadelphia	**13.50**	13.50	13.00	24.50
Heavy Steel Scrap, Pittsburgh	14.00	14.00	14.00	21.50
Heavy Steel Scrap, Chicago	11.50	11.50	11.50	18.25
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	**1.48½**	1.48½	1.43½	1.93½
Common Iron Bars, Chicago	**1.50**	1.50	1.40	1.80
Common Iron Bars, Pittsburgh	**1.40**	1.40	1.34¾	1.85
Steel Bars, Tidewater	**1.49½**	1.49½	1.44½	1.75
Steel Bars, Pittsburgh	**1.35**	1.35	1.30	1.60
Tank Plates, Tidewater	1.74½	1.74½	1.74½	1.85
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater	1.74½	1.74½	1.74½	1.75
Beams, Pittsburgh	1.60	1.60	1.60	1.60
Angles, Tidewater	1.74½	1.74½	1.74½	1.75
Angles, Pittsburgh	1.60	1.60	1.60	1.60
Skelp, Grooved Iron, Pittsburgh	....	....	1.45	2.00
Skelp, Sheared Iron, Pittsburgh	....	....	1.50	2.10
Sheets, No. 27, Pittsburgh	*2.15*	2.15	2.20	2.65
Barb Wire, f.o.b. Pittsburgh	2.50	2.50	2.50	2.60
Wire Nails, f.o.b. Pittsburgh	1.90	1.90	1.90	2.00
Cut Nails, f.o.b. Pittsburgh	**1.75**	1.75	1.70	2.15
METALS:				
Copper, New York	**12.75**	12.75	12.50	15.00
Spelter, St. Louis	**4.95**	4.80	4.82½	5.40
Lead, New York	4.50	4.50	4.50	4.65
Lead, St. Louis	*4.42½*	4.40	4.45	4.57½
Tin, New York	**28.35**	28.85	28.00	30.00
Antimony, Hallett, New York	**7.25**	7.25	7.00	7.00
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.64	3.64	3.64	3.99

Chicago.

FISHER BUILDING, March 30, 1904.—(*By Telegraph.*)

Damage by floods over a large area in the West has temporarily stopped many operations that called for Pig Iron and Finished Iron and Steel, and this temporary setback is reflected in the Chicago market. Notwithstanding this fact, the general feeling is stronger than it has been and prices are firmer in most lines, with an upward tendency. Southern Pig Iron producers are in the main adhering to prices on the basis of $10 for No. 2, Birmingham, with here and there an exception, usually on the part of furnaces enjoying a lower freight rate than does Birmingham. The cut in freight by roads north of the Ohio River has affected neither prices nor tonnage, the majority of contracts being made on the base price, which gives the buyer any advantage of the reduction in rate. Northern Iron is held at from $14 to $14.50 for No. 2 Foundry grade, and sales have been quite large in the aggregate, though no noteworthy lots have changed hands. Lake Superior Charcoal Iron is stronger in tone, furnaces apparently being a unit in charging $14 at the furnace, which would make the price range from $15.25 to $15.75, Chicago, according to freight distance. A good trade is being booked in Forging and Axle Billets at pool prices. A pronounced factor in the Finished Steel markets is the fact that implement manufacturers are exceptionally busy, most of them having largely increased their shop orders as a consequence of the feeling that their utmost efforts will be required to supply the farmers of the country with the machines they will require the coming season. The same is true of wagon manufacturers, whose purchases in Bars and Tire are unusually heavy. The decrease in the number of vehicles manufactured during the last two years, owing to unfavorable conditions, has left stocks very low, and

there is a possibility that the demand this summer will exceed the supply. Iron Bars are good sellers at 1.50c.; with some trading done at $1 per ton higher or lower where special conditions prevail. Steel Bars seem to have been stimulated, rather than the reverse, by the recent advance of $1 per ton. Demand for Rails and Track Supplies is better from electric railroads and about on an even keel from the steam roads. Structurals are a little more expensive, though the promised boom has not yet developed. Plates are still quiet, with some indications of a little more activity. Sheets have been advanced all along the line, the increased demand doing for the independent manufacturers what an association agreement could not do. Merchant Pipe mills will have difficulty in executing the orders on their books, and already some mills are a number of weeks behind their orders. Boiler Tubes are firmer in tone and come nearer to selling at official prices than they have for some months. Cast Pipe plants are doing a fair business in small tonnages over a widespread area. Old Materials are still weak, with the indication that the supply is considerably greater than the demand. Nails and Wire products are in active demand, with the tendency toward higher prices. Coke is strong in tone, with some melters paying premiums for spot Coke on track because of the difficulty of securing shipments.

Pig Iron.—Southern Iron producers are, in the main, adhering to their price based on $10 Birmingham, for No. 2, and buyers are gradually, though somewhat reluctantly, placing orders at that figure. Their reluctance is not based on a feeling that $10 is too high a price for Southern Iron, but on the hope that history may repeat itself and some producers weaken and cut the price, resulting in a general demoralization of the market. This has happened so many times before that buyers hope to be able to bring it about again. They are given encouragement by some producers who are inclined to weaken, and by the fact that Irons produced in the Southern field nearer to Chicago than Birmingham are being offered in some instances on the basis of $10 at the furnace, which would be equivalent to $9.75 at Birmingham. The 35c. cut in freight rate north of the Ohio River on Southern Iron, which is now in effect and will be until April 1, makes no difference in the quoted price on Iron, as the majority of the contracts in force give to the buyer any advantage in freight that occurs during the life of the contract, sales being made on the basis of the fixed price, Birmingham, plus actual freight. There is no doubt that the policy of holding Southern Iron on the basis of $10 is temporarily curtailing business, and that some melters are buying Northern instead. However, the increase in volume of business done by Northern furnaces in this market is not sufficient to terrify Southern producers. It may be taken as an axiom that the trade in this territory will consume almost a given proportion of Southern and Northern Iron during the year, and that only the most ruinous cuts in price on the part of Southern producers would very greatly change this proportion. Northern Iron is being held firmly on the basis of $14 for No. 2 at Chicago as the minimum, with some producers demanding $14 at the furnace, which would mean from $14.25 to $14.50, delivered. The producers who are making this stand acknowledge that it has resulted in a diminution of business, but are satisfied to let business go elsewhere if it cannot be secured at their price. Lake Superior Charcoal is now being held very generally at $14 at the furnaces. As freight rates to Chicago vary from $1.25 to $1.75, the Chicago price on Lake Superior Charcoal would be $15.25 to $15.75, delivered. Iron interests here are encouraged by the general revival in buying on the part of jobbing foundries, Malleable Iron works and melters generally. There is nothing startling about the increase in business, but the movement is sufficiently marked to encourage sellers to the belief that we have already seen the worst that 1904 will offer, and that a review of the business at the close of the year will make it compare favorably with any other normal year. Prices prevailing in this market are as follows:

Lake Superior Charcoal	$15.25 to $15.75
Northern Coke Foundry, No. 1	14.50 to 15.00
Northern Coke Foundry, No. 2	14.00 to 14.50
Northern Coke Foundry, No. 3	13.50 to 14.00
Northern Scotch, No. 1	14.75 to 15.25
Ohio Strong Softeners, No. 1	15.30 to 15.80
Ohio Strong Softeners, No. 2	14.80 to 15.30
Southern Silvery, according to Silicon	14.85 to 15.85
Southern Coke, No. 1	.... to 14.35
Southern Coke, No. 2	.... to 13.85
Southern Coke, No. 3	.... to 13.35
Southern Coke, No. 4	.... to 12.85
Southern Coke, No. 1 Soft	.... to 13.85
Southern Coke, No. 2 Soft	.... to 13.35
Southern Gray Forge	.... to 12.60
Southern Mottled	.... to 12.35
Malleable Bessemer	14.00 to 14.50
Standard Bessemer	15.80 to 16.30
Jackson County and Kentucky Silvery, 6 to 10 per cent. Silicon	16.80 to 18.30
Alabama Basic	.... to 13.85
Virginia Basic	14.60 to 14.85

Billets.—Producers profess to feel encouraged at the betterment in demand for Forging Billets and Axle Billets. Prices are maintained at $24 per ton, Chicago, for Open Hearth or Bessemer Billets, 4 x 4 and larger, and $25 per ton for Axle Billets and for Forging Billets smaller than 4 x 4.

Rails and Track Supplies.—Nothing of startling interest has developed in this market. Inquiries from electric roads are fairly active and there is a moderate buying movement. Large orders from steam roads are conspicuous by their absence. Standard Section Rails remain at $28 per ton, Chicago, and Light Section Rails range from $24.50 to $26, Chicago or Milwaukee. Angle Bars are still quoted 1.40c. to 1.50c., Spikes at 1.70c. to 1.80c., base, while Track Bolts have been reduced to 2.30c. to 2.35c., base, with Square Nuts, and 10c. to 15c. extra for Hexagon Nuts. The prices on Light Rails and on Track Supplies are by no means inflexible, being reduced when necessary to secure business on a competitive basis.

Structural Material.—Warehousemen and Structural yards in Chicago have increased their price from store to 2c. per lb. as the minimum in any quantity, and ranging from there up to 2.10c. for small requirements. The demand for shipment of Steel for buildings is somewhat better than it has been, though it is still below normal. Prices from mill are unchanged, as follows: I-Beams and Channels up to and including 15 inches and Angles 3 inches on one leg and larger, 1.76½c., Chicago; Tees, $1 per ton extra. Store prices on Structurals as advanced are as follows: Angles, Beams, Channels and Zees, base sizes, 2c. to 2.10c.; Tees, 2.05c. to 2.15c., either random lengths or cut to lengths 5 feet and over.

Plates.—The volume of business in Plates is still far short of what producers and dealers have been taught to expect by the experience of the past two or three years. Boiler manufacturers are evidently producing only a small fraction of their ordinary output. It is possible that incursions of the gas engine, and more recently of the turbine, into the power field are so considerable that the boiler business will never again be what it has been, though boilers will always be made and Boiler Plate always be sold in large quantities. The great falling off in demand for bridges on the part of railways and municipalities and boards of county officers is also affecting the business unfavorably. It is encouraging, however, to note that the Plate business is a little better each week than it was the week before, even though it is far behind last year's figures. We quote, carload lots, from mill, f.o.b. Chicago: Tank Steel, ¼-inch and heavier, 1.76½c.; Flange Steel, 1.86½c.; Marine, 1.96½c.; Universal Mill Plate, 1.76½c. to 1.81½c.; 3-16 inch Tank, 1.86½c.; Nos. 7 and 8, 1.91½c.; No. 9, 2.01½c.; No. 10, 1.91½c. to 1.96½c.; No. 11, 1.96½c. to 2.01½c.; No. 12, 2.01½c. to 2.06½c. From store Plates are selling at 2c. for Tank quality, ¼-inch and heavier; 2.10c. for 3-16; 2.15c. for No. 8; 2.20c. for No. 10, with 25c. per 100 lbs. for Flange quality.

Sheets.—It appears that the promised reduction in wages of rollers in Sheet mills has been more than discounted by the prices of the last month or two, and now that the basis is practically settled, prices are firming up, instead of growing weaker. Independent mills in the West profess to have enough business to keep their plants running three or four months, and as a consequence have advanced their prices from $2 to $3 per ton, bringing them up to about the level of the prices of the American Sheet & Tin Plate Company. The following prices represent those of the leading producer No. 16 and heavier being for Blue Annealed and No. 18 and lighter for Box Annealed. Possibly $1 a ton better than these prices can be done on exceptionally large specifications for shipment from independent mills: Nos. 9 and 10, 2.01½c.; Nos. 11 and 12, 2.06½c.; Nos. 13 and 14, 2.11½c.; Nos. 15 to 17, 2.16½c.; Nos. 18 to 21, 2.21½c.; Nos. 22 to 24, 2.26½c.; Nos. 25 and 26, 2.31½c.; No. 27, 2.36½c.; No. 28, 2.46½c.; No. 29, 2.56½c.; No. 30, 2.71½c. Prices from store remain unchanged, notwithstanding the higher mill prices, and are quoted as follows: Nos. 8 and 10, 2.15c. to 2.20c.; No. 12, 2.20c. to 2.25c.; No. 14, 2.30c. to 2.35c.; No. 16, 2.40c. to 2.45c.; Nos. 18 and 20, 2.50c. to 2.55c.; Nos. 22 and 24, 2.55c. to 2.60c.; No. 26, 2.65c. to 2.70c.; No. 27, 2.75c. to 2.80c.; No. 28, 2.80c. to 2.85c.; No. 29, 2.95c. to 3c.; No. 30, 3.10c. to 3.15c. Galvanized Sheets are still quoted by the leading producer on the net basis equivalent to about 80 and 3 discount, Pittsburgh, or 75, 10 and 5, Chicago, though 75, 10 and 7½ and 80 per cent., or better, Chicago, are being offered on desirable car lot orders by independent producers. Store prices on Galvanized Sheets remain unchanged at 75 and 7½ to 75 and 10 per cent. discount.

Bars.—Agricultural implement manufacturers have apparently come to the conclusion that the farmers will buy every machine that they can produce from now until the close of the selling season. As a result of this conclusion implement plants are running full force, some of them on both day and night turns, and the buying of Steel that enters into such implements is unusually active. The same is true of wagon manufacturers, even to a more marked degree, and this activity is reflected in an increased volume of orders and specifications for both Iron and Steel Bars. There is a well defined feeling on the part of buyers of Bars that the

present prices are the lowest at which Bars can be bought for some time, and that any change from this price will be an advance. Steel Bars are held absolutely on the basis of 1.35c., Pittsburgh, or 1.51½c., base, half extras, Chicago, in car lots, with 5c. extra for less than car lots and the usual quantity extras. Iron Bars are held quite firmly at 1.50c. in car lots and 1.55c. in less than car lots, Chicago, although one producer has been offering Iron as low as 1.45c. in exceptionally large lots where special conditions made the order particularly desirable for that mill. Steel Hoops are firm at 1.56½c. rates, full extras, in carload lots, Chicago. Store prices on Bars are as follows: Iron Bars, 1.75c., base, full extras; Steel Bars, 1.70c. to 1.80c., base, half extras; Hoops, 2.10c. rates, full extras.

Merchant Steel.—Apparently implement manufacturers have caught up with supplies ordered before the advance, as their new specifications on contracts are coming in liberally. There is a persistent rumor that Shafting will be advanced at the association meeting held in New York, April 6, in line with the advance on Bars, though when Bars were reduced $6 per ton in January, Shafting was only reduced about $5 per ton, and the recent advance in Bars places Shafting and Bars about on the same basis that they were sold before the midwinter cut in the Bar price. We repeat quotations, as follows: Open Hearth Spring Steel to the general trade, 2c. to 2.25c.; Smooth Finished Machinery Steel, 1.76½c. to 1.81½c.; Smooth Finished Tire, 1.71½c. to 1.76½c.; Sleigh Shoe, flat, 1.56½c. to 1.61½c.; Sleigh Shoe, concave and convex, 1.66½c. to 1.71½c.; Cutter Shoe, 2.25c. to 2.35c.; Toe Calk Steel, 2.06½c. to 2.11½c.; Crucible Tool Steel, 6½c. to 8c.; Special Tool Steel, 12c. up; Shafting at 52 per cent. in car lots and 47 per cent. in less than car lots.

Merchant Pipe.—No changes have taken place in Pipe prices, and the demand continues with unabated activity. Discounts are as follows in car lots from mill, f.o.b., Chicago:

	Steel Pipe.		Guar. Wr'ght Iron.	
	Black.	Galv.	Black.	Galv.
	Per cent.	Per cent.	Per cent.	Per cent
⅛ to ⅜ inch	66.35	56.35	64.35	54.35
½ inch	69.35	59.35	67.35	57.35
¾ to 6 inches	73.35	63.35	71.35	61.35
7 to 12 inches	69.35	59.35	66.35	56.35

Less than carloads, 12½ per cent. advance.

Boiler Tubes.—The slight improvement noted last week is if anything more marked this week, and the tendency to cut prices on the part of independent mills is correspondingly less in evidence. The following discounts are those quoted officially by the leading producer, and it is understood that an extra 5 per cent. is offered to large carload lot buyers:

	Steel.	Iron.	Seamless steel.
1 to 1¼ inches	43.35	40.80	53.35
1¾ to 2¼ inches	55.85	38.35	40.35
2½ inches	58.35	43.35	40.35
2¾ to 5 inches	64.35	50.85	up to 4 in. 48.35
6 to 13 inches	55.85	38.35	....

Store discounts on Boiler Tubes remain nominally at least as follows:

	Steel.	Iron.	Seamless steel.
1 to 1½ inches	40	35	37½
1¾ to 2½ inches	50	32½	35
2¾ to 5 inches	60	45	45
6 inches and larger	50	32½	..

Cast Iron Pipe.—The Indian Territory and Oklahoma contracts spoken of last week have not yet been closed, as it is necessary for the Government to pass upon contracts before they are consummated. Notwithstanding the strength of Pig Iron prices on Pipe remain unchanged, as follows: 4-inch Water Pipe, $26; 6 to 12 inch, $25; larger than 12-inch, $24, with $1 per ton extra for Gas Pipe.

Old Material.—The unusual demand for certain lines of Old Material noted in dispatches from Eastern markets is not reflected here. The leading buyers of Scrap have anticipated their wants and are practically out of the market, except for small lots to sweeten up stock for the next 60 to 90 days. On the other hand, the opening up of spring has permitted railroads to gather very large tonnages of material from their rights of way, and those tonnages are now being placed on the market, exercising a bear effect on prices. The Chicago market on Scrap is a weak market, though weakness has not developed to the extent to make it advisable to lower prices on our list, which we repeat from last week. We quote as follows, per gross ton, Chicago:

Old Iron Rails	$16.50 to $17.00
Old Steel Rails, 4 feet and over	13.00 to 13.50
Old Steel Rails, less than 4 feet	11.50 to 12.00
Heavy Relaying Rails, subject to inspection	23.00 to 24.00
Heavy Relaying Rails, for side tracks	18.00 to 20.00
Old Car Wheels	14.50 to 14.75
Heavy Melting Steel Scrap	11.50 to 12.00
Mixed Steel	9.50 to 10.50

The following quotations are per net ton:

Iron Fish Plates	$13.50 to $14.00
Iron Car Axles	17.00 to 17.25
Steel Car Axles	14.50 to 15.00
No. 1 Railroad Wrought	12.50 to 13.00
No. 2 Railroad Wrought	11.50 to 11.75
Shafting	13.50 to 14.00
No. 1 Dealers' Forge	10.00 to 10.50
Wrought Pipe and Flues	8.50 to 9.00
Iron Axle Turnings	8.75 to 9.00
Soft Steel Axle Turnings	8.75 to 9.00
Machine Shop Turnings	7.25 to 7.50
Cast Borings	4.75 to 5.00
Mixed Borings, &c	4.75 to 5.00
No. 1 Mill	7.50 to 7.75
Country Sheet	7.00 to 7.25
No. 1 Boilers, cut in Sheets and Rings	9.00 to 9.50
Heavy Cast Scrap	12.00 to 12.50
Stove Plate and Light Cast Scrap	9.50 to 10.00
Railroad Malleable	10.00 to 10.50
Agricultural Malleable	9.50 to 10.00

Metals.—Copper has advanced ⅛c., Casting Copper being quoted at 13c. and Lake at 13¼c. Pig Tin has dropped from 30c. to 29½c., with spot sales at about 29¾c. Pig Lead is unchanged at 4.45c. in 50-ton lots, 4.55c. in car lots, 4.85c. in ton lots or less. Spelter is still quoted at 5c. Sheet Zinc has advanced 10c., the market price at Chicago now being 5.75c. per lb. in car lots of 600-lb. casks and 5.95c. to 6c. for less than car lots. Old Heavy Copper and Copper Bottoms are about ⅛c. higher, Copper Clips advanced ⅛c. and Red Brass ⅛c. higher. We quote Old Metals as follows: Copper Wire and Heavy, 11⅝c.; Copper Bottoms, 10⅝c.; Copper Clips, 10¾c.; Red Brass, 10½c.; Red Brass Borings, 8⅞c.; Yellow Brass, Heavy, 8½c.; Yellow Brass Borings, 6½c.; Light Brass, 6c.; Heavy Lead, 4.25c.; Tea Lead, 4.10c.; Zinc, 3⅝c.; Block Tin Pipe, 24c.; Pewter, No. 1, 19c.

Coke.—The situation is unchanged since last week, but the tendency is stronger; $2.25 now seems to be the bottom price for 72-hour Foundry Coke in the Connellsville region, with favored brands selling readily at $2.50. This makes the selling price, Chicago, $4.90 to $5.15 per ton in car lots. Ovens along the right of way of the L. & N. road are still offering Coke at $2 to $2.25, which, with the reduced freight rate offered by that road, brings these Cokes to Chicago at $4.25 to $4.50 per ton. There is no relief in sight in the matter of car service.

The C. A. Stevenson Pig Iron & Coke Company, St. Louis, Mo., report having temporarily closed their Chicago office, appointing A. B. Stevenson, who was in charge of the Chicago branch, sales manager of the St. Louis general offices.

The Republic Iron & Steel Company will move their general offices during April from their present location, on the eighth, ninth and tenth floors of the Stock Exchange Building, Chicago, to new quarters embracing the whole fifteenth floor of the west wing of the First National Bank Building. On the completion of the east wing of that building their offices will again be moved to occupy the whole of the sixteenth floor of the new wing.

Philadelphia.

FORREST BUILDING, March 29, 1904.

There is very little change to note in the Iron and Steel trades as compared with last week. The demand is active and prices are firm, without being higher. The supply of Pig Iron seems to be well taken up, and while there is no great difficulty in getting reasonably prompt deliveries, some descriptions command a slight premium for shipments during the second quarter. The feeling in regard to prices is that they are not likely to rule as low as seemed probable two or three months ago, nor are they likely to advance beyond their present level, although, of course, later developments may lead to a modification of these views. General conditions may be said to be about fair. There is a good day to day demand, but orders for forward deliveries are not large, so that there is likely to be a prompt response for better or worse, according to the amount of business that may be forthcoming. The long winter and the loss by flood and fire are discouraging features, but these would soon be forgotten if the demand became anyway active. As a matter of fact, the next two or three weeks are expected to give a pretty fair idea of what the character of business is to be during the spring and summer months. This was so fully discussed on page 30 of last week's issue of *The Iron Age*, however, that further comment would be superfluous. Since then nothing has occurred to change the general outlook. Winter hangs on tenaciously, and the labor situation is rather unfavorable, but there is no ground for serious apprehension in regard to these matters at the present time.

Pig Iron.—A somewhat quiet but very firm undertone is reported in Pig Iron. A great deal of Iron has been sold during the past two or three weeks, and there is a fair demand yet, but large buyers appear to have supplied themselves before prices were advanced. Sales are being made in a moderate way at $10, f.o.b. for Alabama No. 2 X Foundry, and $15.25 for Northern brands; some get as high as $15.50 for small lots, but this is more than offset by others at less than $15.25. Good brands of mill Irons are scarce, but they can be had at from $13.25 to $13.75, delivered, which, however, is mostly for April and May shipments. Basic

Iron is strong at $14, at which price large sales have been made, and more would be taken at a slight concession from that figure, but for the present sellers are not inclined to go below $14, as they are well sold up. The course of the market in the near future will depend entirely on the demand. During the past month sales have been larger than the output, but whether consumers have overbought or not remains to be seen. There has been some activity in Low Phosphorus Irons, and sales to the extent of about 10,000 tons have been made, some for local deliveries, but the larger portion for distant points. The course of the market during the next two of three weeks will be watched with considerable interest, as at the moment opinions are somewhat confused in regard to the final outcome. Prices are a little irregular; small lots sometimes command $15.50 for No. 2 X Foundry, but a fair average for Philadelphia and nearby deliveries would be as follows:

No. 1 X Foundry	$15.75 to $16.00
No. 2 X Foundry	15.00 to 15.25
No. 2 Plain	14.50 to 14.75
Southern No. 2, rail shipment	14.25 to 14.50
Southern No. 2, on dock	13.75 to 14.00
Standard Gray Forge	13.50 to 13.75
Ordinary Gray Forge	13.00 to 13.25
Basic	13.90 to 14.00

Steel.—The demand for Steel is quite active, and mills are so well sold up that slight premium is required for April and May deliveries. Minimum prices are about $25, delivered, and a trifle higher for small lots or for immediate shipments.

Plates.—The demand for Plates is not in line with other specialties, but it is expected to improve in the near future. The demand from large consumers, however, is very disappointing, but general business appears to be satisfactory, so that the mills are moderately well employed on small and medium sized orders. Prices are unchanged, as follows:

	Carloads. Cents.	Part carloads. Cents.
Tank Steel, ¼ inch and heavier	1.73½	1.78½
Tank Steel, 3-16 inch	1.83½	1.88½
Tank Steel, Nos. 7 and 8, B. W. G.	1.88½	1.93½
Tank Steel, Nos. 9 and 10, B. W. G.	1.98½	2.03½
Flange or Boiler Steel	1.83½	1.88½
Commercial Fire Box Steel	1.93½	1.98½
Still Bottom Steel	2.03½	2.08½
Locomotive Fire Box Steel	2.23½	2.28½
Plates over 100 to 110 inches	.05 per lb. extra	
Plates over 110 to 115 inches	.10	"
Plates over 115 to 120 inches	.15	"
Plates over 120 to 125 inches	.25	"
Plates over 125 to 130 inches	.50	"
Plates over 130 inches	1.00	"
All sketches (excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)	.10	"
Complete Circles	.20	"
Shell grade of Steel abandoned.		

Structural Material.—There is a good miscellaneous demand, but large orders are still held in abeyance. Inquiries are on the market for considerable quantities, some of which will probably be placed in the near future, but the attitude of labor in the building trades is something of a menace to immediate operations. Prices unchanged, as follows: Beams, Channels and Angles, 1.73½c. to 1.85c., according to specification, and small Angles, 1.50c. to 1.55c.

Bars.—There is a strong tone to prices of both Iron and Steel Bars, and mills are taking in a good deal of business, partly on the assumption that an advance will be made in the near future. For the present 1.48½c. to 1.50c. is quoted for city or nearby deliveries.

Sheets.—The demand is not as active as it has been for some weeks past, although the mills still have a good deal of work on hand. Prices steady, but buyers seem to be unwilling to take large lots unless at slight concessions.

Old Material.—The demand is fully maintained and holders ask extreme prices. Sales at medium figures; in some cases outside rates are paid for prompt deliveries. Bids and offers are about as follows for deliveries in buyers' yards:

Old Steel Rails	$15.00 to $15.50
Steel Scrap, light to heavy	14.50 to 15.25
Low Phosphorus Scrap, nominal	18.50 to 19.00
Old Steel Axles	18.00 to 19.00
Old Iron Rails	18.50 to 19.00
Old Iron Axles	21.50 to 22.00
Old Car Wheels	13.50 to 14.00
Choice Scrap, R. R. No. 1 Wrought	18.00 to 18.50
Country Scrap	16.50 to 17.00
Machinery Scrap	13.50 to 14.00
No. 2 Light Scrap	12.00 to 13.00
No. 2 Light (Ordinary)	10.50 to 11.00
Wrought Turnings	9.75 to 10.00
Wrought Turnings, Choice Heavy	10.50 to 11.00
Cast Borings	7.50 to 8.00
Stove Plate	12.00 to 12.50
Wrought Iron Pipe	13.00 to 13.50

Beaudry & Co., Boston, Mass., manufacturers of the Champion power hammer, announce that they will remove their office this week from 147 Milk street to the new Oliver Building at Oliver and Milk streets.

Birmingham.

BIRMINGHAM, ALA., March 28, 1904.

The market for Iron the past week held its own very well. There was no concession in prices, but there was in some cases an advance obtained that clearly indicated the course of the market. There was no furious demand, and neither was there what might be called an active demand, but there was enough demand to make the market firm. Some interests that have been rather pessimistic in their views are changing over now to the other side, and the influence is, naturally, that they have secured orders to justify the use of the optimistic lens in diagnosing the market. Anyway, there are very few who are willing to go on record as being satisfied that prevailing quotations are the top of the market. That there was an appreciable advance is shown by the figures that indicate the prices of Iron toward the close of the week. Some of the interests choked off the demand either by asking a further advance or from being unable to find in stock the grades desired.

Two weeks ago the sellers were seeking buyers for Gray Forge and other grades of low degree, and were accepting any prices necessary to move the Iron. Suddenly a buying movement sprang up for these grades, and now it is a difficult matter to find an interest with any quantity of these grades on hand, while the buyers are bidding for it to bring it out; and, so far, without success. The result is that, while two weeks ago one could buy this grade at $8.25 and less, it has advanced to $9, and even above that price. This is the best evidence that could be adduced of the demand for this grade. At the close of the market there was none offering, but bids were being considered, and about $9.25 were the figures asked for it. Under present conditions No. 4 Foundry ranges around the same figures. For both grades there is a good demand, but it takes the price to bring it out. The truth is it has been so freely sold that there is very little left on the furnace yards with maker's name on the tags. The ownership of these grades has of late largely changed hands, and all that sellers cared to dispose of for the next 60 days has been placed. For No. 3 Foundry there has been a very fair demand, and of sufficient strength to keep prices firm. It has varied some, but has been a close follower of the other grades, and at the end of the week closes at an advance equal to any of the grades. There were some sales at $9.25 and even $9, it is charged, was worked, but if that be so it could have been for only a limited amount, as your correspondent was shown sales on a basis of $9.25, net, to the furnace for several lots sold by different interests. There were several sales that came in Saturday on the basis of $9.75 regular. Take off the commissions and the net results are mighty close to $9.50.

Coming to No. 2 Foundry, the fluctuations have probably been greater than in any other grade, but they have not been great on this grade. The prevailing asking price has been $10 for ordinary amounts. If a large buyer entered the price could probably be shaded, but we are not having these large buyers; it is the day of the medium and small buyer. Early in the week $10 was not adhered to, and in a few instances prices were lowered and some sales were made at $9.75, but in nearly every case there was a sort of side line inducement offered to the seller which was accepted. Toward the close of the week $10 was the generally accepted price and business was transacted on that basis.

A most important feature of the market is the extent of the sales made. One of the leading interests acknowledges to recorded sales of about 150,000 tons, while others say they have recorded enough sales to make them comfortable for the next 90 days, and your correspondent is satisfied that the anticipated output for that period has been absorbed. It has not been by sensational sales, but just in the course of ordinary business. Some capacity has been reserved to meet the varying moods of the market, but as a rule the sales for the next 90 days will absorb the output. A good deal of business is being turned down just from an indisposition to offer in a way that would indicate a disposition to court buyers. The soft grades are also in but limited supply and are held very firm at outside prices. In fact, if there are any soft spots they are not apparent.

The majority of the sales are covered by the second quarter in delivery, but there has been a right smart sprinkling of sales made for delivery into the third quarter. As a rule these sales have been made on the basis of current values, but there has been a very appreciable number of them made at an advance of, say, 25c. above current values.

Some Basic Iron is being moved, but only in a limited way and on a basis of $10. There is a good deal of activity among the Pipe works, and large contracts for domestic delivery and also for delivery to Mexican and West India points are under consideration. While none of them so far are actually in the market, they are keeping in close touch with it, and it is simply a question of time—and that not far off—when they will be in the market again for quite respectable amounts.

The quotations for Pipe are on the base price of $21 for the 4 and 6 inch sizes, which prices present conditions seem

to indicate will be advanced. In fact, an optimistic feeling of late has usurped all other feelings, and the only bad feature in the market is that all are now getting on one side of it.

(By Telegraph.)

BIRMINGHAM, ALA., March 30, 1904.—The Iron market continues firm at prices last quoted, with sales not infrequent at a slight advance. The scarcity in some grades is growing. The Pipe works have a very large inquiry, and some important deals are now being negotiated. The Dimmick Pipe Works have concluded an important contract with St. Louis, involving 11,000 tons, and it is a question of only a short time before all the Pipe companies will be in the market again to supply unusually heavy requirements. There is no surplus stock of moment in furnace yards to supply an active demand. The outlook is decidedly optimistic, and any active buying would stimulate prices.

Pittsburgh.

PARK BUILDING, March 30, 1904.—*(By Telegraph.)*

Pig Iron.—A heavy demand exists for Bessemer and Basic Iron for April delivery, and the visible supply of the Valley furnaces for that month has been practically all sold, most of it on the basis of $13.50 at furnace. Sales of about 10,000 tons of Bessemer are reported, mostly for April delivery, at that price. It is almost certain that the Steel Corporation will buy the additional 40,000 tons of Bessemer Iron, for which they hold an option good until April 10, the price being $13, Valley furnace. There is a good deal of inquiry for Foundry Iron, and Northern brands of No. 2 are held at $13, Valley, or $13.85, Pittsburgh, but we are advised that some furnaces are holding their Iron at $13.25 to $13.50, at furnace, equal to $14.10 and $14.35, Pittsburgh. Southern furnaces are holding No. 2 Foundry Iron at $9.50, Birmingham, equal to $13.85, Pittsburgh, while some sellers ask 25c. higher. There is a fair inquiry for Forge Iron, and Northern brands are held at about $13.25, Pittsburgh. Southern Forge is held at $8.50, Birmingham, equal to $12.85, Pittsburgh.

Steel.—We note quite an active demand for Steel, and prices are very firm, especially on Sheet Bars, which are scarce and hard to obtain for prompt delivery. In some cases a premium of 50c. a ton over official prices has been paid for Sheet Bars for spot shipment. We quote Bessemer and Open Hearth Billets at $23, Pittsburgh; Sheet Bars, Bessemer and Open Hearth stock, $23.50 for long lengths, and $24 cut to lengths.

Coke.—The car supply in the Connellsville region has been very much better within the past few days, and on Monday and Tuesday of this week the operators got practically all the cars they needed. Prices are very firm, and Connellsville 72-hour Foundry is selling at $2.35 to $2.50 a ton, at oven, for prompt shipment. Connellsville Furnace Coke readily brings $1.65 to $1.75 a ton for prompt delivery.

(By Mail.)

Despite reports to the contrary, we can state that the blast furnaces in the Mahoning and Shenango valleys that participated in the tonnage of Bessemer Iron placed by the United States Steel Corporation have made remarkably good deliveries, and it is probable that of the 50,000 tons of March Iron not more than 1500 to 2000 tons will remain to be shipped, and this Iron may be canceled. Only one furnace is considerably behind in deliveries, and this was for the reason that this stack could not get prompt deliveries of Coke. When the Steel Corporation placed the large tonnage of Bessemer Iron most of the blast furnaces in the two valleys were idle, and had practically no Coke on hand. Considering these furnaces had to get started, make contracts for a supply of Coke, and overcome other difficulties due to shortage of cars and other causes, the prompt deliveries they have made on the Steel Corporation Iron were certainly very satisfactory, and showed considerable energy on the part of the furnace operators. As yet the Steel Corporation have not given any intimation as to whether they will exercise the option for 40,000 tons more of Bessemer Iron, which they hold and which expires on April 10, but it is generally believed this Iron will be bought and for May delivery. The price is $13, at Valley furnace.

Results of the vote now being taken by Tin Plate workers in union Tin Plate mills, and which are being received daily by the Amalgamated Association in this city, indicate that the vote will be decidedly against the proposed reduction of 20 per cent. The result is expected to be absolutely known on Wednesday evening, March 30, and if it proves to be against the reduction, it is not known what action the Amalgamated Association will take. At the mills of the Pope Tin Plate Company, Steubenville, Ohio, the men voted solidly against the reduction, and went out on strike but afterward returned to work at the reduction, which is effective only until April 2. The men employed at the Greer and Shenango works of the American Sheet & Tin Plate Company, at New Castle, voted in favor of the reduction.

There have been no special developments in the Iron trade in the week under review. The demand for Bessemer and Basic Iron for April and May delivery is very heavy, and practically all of the Iron that the Valley furnaces can spare for April delivery has been sold, most of it on the basis of $13.50, Valley, which is 50c. a ton higher than the Steel Corporation paid. The demand for Foundry and Forge Iron is fairly active, and the whole Pig Iron market is quite firm. There is a good deal of demand for Steel, and we are advised that all the tonnage sold for some time in both Billets and Sheet Bars has been at full official prices. In fact, in several cases Sheet mills have paid a premium of 50c. a ton over official prices for Sheet Bars for immediate shipment. In Finished Iron and Steel the general situation is good, with the exception of Plates and Structural Steel, the demand for which continues quiet. In Pipe, Wire and Wire Nails, Steel and Iron Bars, Sheets and Tin Plate the demand is quite active, and the mills have a very large tonnage on their books for these products. The car shortage which has existed for some time in the Connellsville region, and in the Pittsburgh district as well, shows signs of betterment, the supply of cars in the last few days being better than for some weeks. In the event of a full supply of cars prices on Coke would soon show a decline.

Ferromanganese.—The market on Ferromanganese seems to be a little firmer, but demand is light. We quote domestic Ferro at $42.50 to $43, delivered. It is stated that the makers of English Ferro cannot compete at these prices and as a result very little foreign Ferro is being brought into this country, except for delivery at points near seaboard.

Muck Bar.—Prices on Muck Bar are firmer than for some time, and demand is also better. We quote domestic grades of Muck Bar at $26.50, Pittsburgh.

Wire Rods.—While new tonnage in Wire Rods is light, the market is very firm. We quote Bessemer and Open Hearth Rods at $31, Pittsburgh.

Steel Rails.—There is very little doing in Standard Sections, the few orders being placed being for small lots. Reports of Pennsylvania and other leading roads placing large contracts are untrue. There is a large demand for Light Rails, and the mills are entering a good deal of tonnage. Prices, however, are very low, being about $5 a ton under the price of Standard Sections. This is an unusual condition and is due to the fact that there is no agreement on Light Rails, the market being open. In addition, there are quite a number of small mills that buy second-hand Rails and reroll them into Light Sections. We quote 12-lb. Rails, $27; 16 and 20 lb., $25, and 25 to 45 lb., $23.

Railroad Spikes.—We note a heavy demand for Railroad Spikes, and some of the mills are sold up for six or eight weeks ahead. Prices are slightly firmer, and we quote at $1.65, base, per 100 lbs.

Structural Material.—The market generally is quiet and no large contracts have been placed in this market recently. Some time ago some of the Western railroads sent in inquiries for considerable tonnage of bridge work, but this has been held off for one reason or another and practically none of it has been closed. There are quite a few small orders coming in, but as a rule the Structural mills are only fairly busy and could take care of a very much larger tonnage if they had it. The Structural shops report new work very dull, and some low prices continue to be made for erection. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6, 1.60c.; Zees, 1.60c.; Tees, 1.60c.; Steel Bars, 1.60c., half extras, at mill; Universal and Sheared Plates, 1.60c.

Plates.—There is no improvement in demand for Plates, which are probably duller than any other product on the whole list. It was expected that the Steel car interests would be in the market for considerable tonnage before this, but so far this class of consumers is placing very little business. We quote: Tank Plate, ¼-inch thick and up to 100 inches in width, 1.60c., at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers', 1.60c., at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price up to 3c. Plates more than 100 inches in width, 5c. extra per 100 lbs. Plates 3-16 inch in thickness, $2 extra; gauge Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms net cash in 30 days.

Sheets.—A vote is now being taken in union Sheet mills by employees who belong to lodges of Amalgamated Association on the proposed reduction of 20 per cent., and this vote is expected to be in on Wednesday, March 30. While the result cannot exactly be told at this time, it looks as though the majority of the vote would be against the reduction. Demand for Sheets is quite heavy, but prices show no improve-

ment whatever, and the general tone of the market is weak. This is probably due to the proposed reduction in wages. We quote: No. 26 Black Sheets at 2.10c. to 2.15c.; No. 27, 2.15c. to 2.20c., and No. 28, 2.25c. to 2.30c., all f.o.b. at mill. The lower prices are available only on large lots. Galvanized Sheets are about 80 and 5 per cent. off, which is equal to 2.85c. for No. 26, 3.04c. for No. 27, and 3.23c. for No. 28. For small lots from store jobbers charge the usual advance over these prices.

Iron and Steel Bars.—The demand for both Iron and Steel Bars is very much heavier than for some time, and several of the leading mills advise us they have entered considerable tonnage in the past two weeks. Some consumers are now willing to make contracts with the usual clause attached that prices are guaranteed against decline. We quote Iron Bars at 1.40c., Pittsburgh, but on large contracts for extended delivery 1.35c. is being named by a few sellers. We quote Steel Bars at 1.35c., Pittsburgh, in carloads and larger lots, with the usual differentials for less than carloads. Open Hearth Bars take $1 a ton advance over Bessemer.

Hoops and Cotton Ties.—A very large tonnage in Cotton Ties has been entered for this season's delivery, and the tonnage in Cotton Ties this year is expected to be much heavier than last. While the market is an open one, the general quotation is 80c. per bundle in 3000 bundle lots and over, and 83c. per bundle for less than 3000 bundle lots. We note, however, that a good deal of tonnage was taken some time since by several of the leading mills at less than the above prices. We quote Steel Hoops at 1.40c. and Steel Bands at 1.35c., extras as per Steel card.

Merchant Pipe.—Demand for Pipe continues heavy, and all the leading mills are well sold up and are entering good tonnage right along. With the advent of good weather, permitting outside operations, some contracts for gas and oil lines are likely to be placed. Several of the larger Pipe mills are not running to full capacity, not because of lack of orders, but are unable to get Skelp fast enough. Prices are very firm and discounts to consumers in carloads are as follows:

Merchant Pipe.

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
	Per cent.	Per cent.	Per cent.	Per cent.
⅛, ¼ and ⅜ inch	68	58	66	56
½ inch	71	61	69	59
¾ to 6 inches	75	65	73	63
7 to 12 inches	71	61	68	58
Extra strong, plain ends, ⅛ to 8 inches	67	57	64	54
Double extra strong, plain ends, ⅛ to 8 inches	59	49	56	46

Boiler Tubes.—Demand for Boiler Tubes is very active, the general trade placing orders quite liberally, while the railroads are also placing more tonnage than for some time. Discounts in carloads to consumers are as follows:

Boiler Tubes.

	Steel.	Iron.
1 to 1½ inches	42½	39
1¾ to 2¼ inches	55½	38
2½ inches	58	43
2¾ to 5 inches	64½	50½
6 to 13 inches	55½	38

Tin Plate.—At this writing it is practically certain that a majority of the lodges of the Amalgamated Association will vote against the proposed reduction of 20 per cent. in wages. In the event of this, it is not known what action the association will take. Demand for Tin Plate is heavy, and the American Sheet & Tin Plate Company have recently started up three of their large mills which have been idle for some time. We quote 100-lb. Coke Ternes at $3.45 per box, f.o.b. Pittsburgh, with the usual slight differential to the large jobbing trade.

Spelter.—Prices on this product are slightly firmer, and we quote prime Western grades at 4.95c. to 5c., Pittsburgh. We note a sale of 25 tons for April and May delivery at the first named price.

Old Material.—The market continues rather quiet, with the single exception of Heavy Steel Scrap, demand for which is quite good, and which is held at $14 to $14.25 in gross tons, Pittsburgh. Old Steel Rails, short pieces, are held at $14 in gross tons; No. 1 Wrought Scrap, $13.25 to $13.50 in net tons; Rerolling Rails, $15.25 to $15.50, gross tons; Busheling Scrap, $10.50 to $10.75, net tons, and Cast Iron Borings, $6 to $6.25 in gross tons.

Coke.—The supply of cars in the Connellsville region has been slightly better than in the past few days, and shipments have been quite heavy. The continued shortage in cars has brought about a heavy demand for Furnace and Foundry Coke for prompt shipment, and strictly Connellsville Furnace Coke for immediate delivery has sold in the last few days at $1.75 a ton at oven. Strictly Connellsville 72-hour Foundry Coke is $2.25 to $2.50 a ton at oven. Of the 28,637 ovens in the Upper and Lower Connellsville regions, 22,520 were active last week.

The offices of McDowell & Co., dealers in second hand Pipe and Machinery, have been removed from 347 Fifth avenue, Pittsburgh, to Grant and Western avenues, Allegheny, Pa.

Cincinnati.

FIFTH AND MAIN STS., March 30, 1904.—(*By Telegraph.*)

Pig Iron.—After the recent great buying movement in Southern Pig Iron it would naturally be supposed that most consumers had their wants supplied, and that any new business offering would be in the nature of irregular lots. As a matter of fact, orders are not as plentiful as they were two weeks ago, but they are coming in steadily and in medium sized lots. There have been some few sales made at $9.75, Birmingham, but the recognized price for No. 2 is $10. Several large lots have been purchased this week. Among others were 1000 and 2000 tons of No. 3 Foundry, 1000 tons of No. 2 Foundry, 1000 tons of No. 4 Foundry and 900 tons of Southern Charcoal Iron. One of the large Ohio agricultural implement concerns, this week, bought heavily for the last half of the year. They are understood to have purchased 3000 tons of Northern and 2000 tons of Southern Iron, paying $10 for the same. This is the only purchase of any size for forward delivery, but there have been several transactions of from 100 to 500 tons, while inquiries for shipment after July are getting more numerous. Southern Iron is reported to be in short supply, particularly Gray Forge and No. 4. Northern prices remain firm, with very little buying movement in sight. It is understood that the Cincinnati Water Works people are about to let a contract for from 50,000 to 60,000 tons of Cast Iron Pipe. The specifications for this contract will probably be ready within the next week. The Allis-Chalmers Company, who recently bought the plant of the Bullock Electric Company, at East Norwood, have purchased the Bollman-Wilson, formerly located at that point, and will run the same in connection with their electric plant. The Bollman-Wilson people will continue to operate their Cincinnati plant as heretofore. Freight rates from Hanging Rock district to Cincinnati, $1.15, and from Birmingham, $2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$13.00 to $13.25
Southern Coke, No. 2	12.50 to 12.75
Southern Coke, No. 3	12.00 to 12.25
Southern Coke, No. 4	11.50 to 11.75
Southern Coke, No. 1 Soft	13.00 to 13.25
Southern Coke, No. 2 Soft	12.50 to 12.75
Southern Coke, Gray Forge	11.50 to 11.75
Southern Coke, Mottled	11.25 to 11.50
Ohio Silvery, No. 1	16.15 to 16.40
Lake Superior Coke, No. 1	14.15 to 14.40
Lake Sperior Coke, No. 2	13.65 to 13.90
Lake Superior Coke, No. 3	13.15 to 13.40

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	$17.00 to $17.50
Lake Superior Car Wheel and Malleable	17.00 to 17.50

Coke.—The Coke market is very active, and transactions would be larger were it not for the shortage of cars required to handle it. Purchases are being made, but deliveries are irregular, and in many cases unsatisfactory. There has been quite a reduction made in the price of Coal from the Pocahontas fields within the last few days, effective April 1. Whether or not this will have any bearing on the price of Coke is uncertain, but this reduction will no doubt be followed in other fields, which will surely affect the price of this commodity. We quote from $2.15 to $2.30 on West Virginia Coke, and from $2.25 to $2.50 on Connellsville, f.o.b. ovens.

Plates and Bars.—Dealers report a steady growth in the upward movement of Bars and Structural Iron. Inquiries have become general and there have been numerous sales, with prices holding firm. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.40c., with half extras; the same in smaller lots, 1.70c., with full extras; Steel Bars, in carload lots, 1.48c., with half extras; the same in smaller lots, 1.80c., with full extras. Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.73c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 2c.; Sheets, 16-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; 14-gauge, in carload lots, 1.95c.; in smaller lots, 2.50c.; Steel Tire, ¾ x 3-16 and heavier, 1.68c., in carload lots.

Old Material.—We are pleased to note a slight awakening in this class of Material. Whether this is merely spasmodic or not no one knows, but there exists a ray of hope that the long lane has had its turning. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, $11 to $11.50 per net ton; No. 1 Cast Scrap, $10 per net ton; Iron Rails, $14.50 per gross ton; Steel Rails, rolling mill lengths, $11 to $11.50 per gross ton; Iron Axles, $15 per net ton; Car Wheels, $11 to $11.50 per gross ton; Heavy Melting Scrap, $11.50 per gross ton; Low Phosphorus Scrap, $11.50 to $12 per gross ton.

The report that the Independent Sheet Manufacturers' Association held a meeting at Pittsburgh last week is untrue.

Cleveland.

CLEVELAND, OHIO, March 29, 1904.

Iron Ore.—The producers will do nothing toward fixing prices until a meeting is held the latter part of this week or the first of next. The furnacemen meanwhile are in the dark. Now the vesselmen are beginning to talk rates. This week the annual conference between the Ore handlers and the docks managers is being held. This conference will fix the rates to be charged for handling the Ore over the docks, and that naturally will affect the rate which is to be charged by the vessel interests for bringing the material down the lakes. The Ore handlers show a disposition to object to any arrangement that will curtail their income, and therefore some trouble may be expected. This will affect the Ore market only by delaying action in the matter of fixing the carrying rates. The disposition is to cling pretty close to last year's prices and likewise last year's rates.

Pig Iron.—The market is strong and advancing. The foundry Iron producers in the valleys have put up the price 25c., this action having been taken on Monday. The best price that can be obtained now is $13.25 in the valleys for No. 2. This price is some times bettered by 25c., when the order is not especially desirable. Furnacemen show no disposition to contract for any great length of time ahead. The bidding for material has been in larger lots during the past week, and several contracts have been closed which have run up into the thousands of tons. The Bessemer situation continues to gain strength. The market discovers a real scarcity of material, with neither Bessemer nor Basic available for immediate delivery and with an improving demand. The price ranges between $13.25 and $13.75 in the valleys for both Bessemer and Basic. The Coke situation is slightly improved, but not relieved by any means. Cars are still scarce. Prices hold steady at $2.25 to $2.50 for 72-hour Coke at the oven, and $2.15 for High Sulphur Cokes at the oven. Good furnace Coke is bringing $1.75 at the oven. We quote Pig Iron prices, f.o.b. Cleveland:

Northern Coke, No. 1 Foundry	$14.00 to $14.25
Northern Coke, No. 2 Foundry	13.50 to 14.00
Northern Coke, No. 3 Foundry	13.00 to 13.25
Southern Coke, No. 1 Foundry	14.35 to 14.60
Southern Coke, No. 2 Foundry	13.85 to 14.10
Southern Coke, No. 1 Soft	14.35 to 14.60
Southern Coke, No. 2 Soft	13.85 to 14.10
Jackson County, 8 per cent. Silicon	16.50 to 17.00
Hanging Rock Charcoal	.... to 23.45
Southern Charcoal, No. 1	19.50 to 20.00
Lake Superior Charcoal	16.50 to 17.00

Finished Iron and Steel.—The market for the lighter grades of material is booming, while the demand for the heavy grades is still holding back. The demand for Hoops, Bands and Bars in this territory has been phenomenal during the week. In Bars the situation is so strong that now the mills can do nothing better than make an offer of delivery from four to six weeks. The same situation obtains to a certain extent with Bands and Hoops, the matter of delivery coming to be an important factor. The recent advance in the price of Bessemer Steel Bars does not seem to have caused the slightest hesitation in the buying, and contracting is now heavy. The buying of Bar Iron is also stronger, although the strength of that market still relies to a considerable extent upon the situation in the Scrap trade. Prices are unchanged at 1.35c., Pittsburgh, for Bessemer Steel Bars and Bar Iron, and 1.40c. for Open Hearth Steel Bars. The buying of Structural has picked up slightly. The market shows a tendency toward better business in the near future, but it cannot be said that there is yet any very large contracting. Specifications against old contracts are keeping the market firm and the mills busy. The price holds at 1.60c., Pittsburgh. If there is any weakness it is in the Billet trade. The mills at several places are reported in need of business, and some of the smaller concerns are inclined to make cuts in order to get business. Other mills are holding out for the association price, but doing without any large amount of business. The price nominally holds at $23.50, Cleveland. The plate trade offers an element of uncertainty. The prices have been steady, seemingly, and the specification against old contracts has been good, but the market has seen no added demand such as would arise from the purchasing by railroads. There is a splendid demand for Light Rails and the market is firm for that product. The call for standard Rails might be improved, however, as the only outlook is for some electric line projects which yet lack financing. The call for Sheets is a little better, but the big spring demand has not yet started in, as outdoor operations have been held back by weather conditions. The call for material has done nothing more than stiffen the prices. The quotations for No. 27 Black Sheets out of stock continue at 2.20c.; for No. 27, One Pass Cold-Rolled, in car lots at the mill, 2.25c. to 2.30c., at the mill; for Galvanied Sheets, No. 16 to No. 20, 75, 10 and 5 off list; for No. 22 and lighter, 75, 10 and 7½ off list.

Old Material.—The Scrap trade has been improved to a certain extent by recent developments. The growth in the demand for Pig Iron has helped Scrap, carrying prices gradually although fractionally upward. In some quarters prices are said to be getting prohibitive. We revise and quote all gross tons: Old Steel Rails, $14 to $15; Old Car Wheels, $13.50 to $14.50; Railroad Malleable, $12 to $12.50; Heavy Melting Steel, $13 to $14. All net tons: Cast Boring, $5 to $5:50; No. 1 Railroad Wrought, $13; No. 1 Busheling, $11.50 to $12; Wrought Turnings, $8; Iron Car Axles, $18; No. 1 Cast Scrap, $11.50 to $12; Stove Plate, $9 to $10.

New York.

NEW YORK, March 30, 1904.

Pig Iron.—Inquiries from belated consumers of Foundry Iron continue to come in; but, on the whole, the volume of business is light. Apparently only a part of the order for about 10,000 tons by a leading electrical company has been placed, and is confined to about 3000 tons of Low Phosphorus Pig for the Steel foundry. The Foundry Iron does not seem to have been taken as yet. The market on Foundry Iron is firmer. We quote: Northern No. 1, $15.50 to $16; No. 2 Foundry, $15 to $15.25; No. 2 Plain, $14.25 to $14.75, and Gray Forge, $13.50 to $13.75. Tennessee and Alabama brands are quoted $13.75 to $14 for No. 2 Foundry, and $13.25 to $13.50 for No. 3 Foundry.

Steel Rails.—The market is exceedingly quiet. The report that the Lehigh Valley had purchased 10,000 tons of Rails cannot be confirmed.

Cast Iron Pipe.—Manufacturers report business very good for the season. The foundries have seldom had so much work on their books so early in the year. A very great deal of small buying is going on which is done without public lettings, but occasionally some important orders are also placed this way. It is regarded as noteworthy that among those now coming in the market are many who have the reputation of being the shrewdest of buyers. Evidently they consider the situation favorable for taking hold. The sales of the past week include 1500 tons to the New Jersey General Security Company for Paterson, Passaic and Montclair, and 1400 tons to Fitchburg, Mass., made by the leading interest. On Friday of this week 1300 tons will be let at Ansonia, Conn. Manufacturers are somewhat stiffer in their views, but carload lots are still quoted at $28 per gross tone for 6 to 10 inch and $27 for 12-inch upward, at tidewater.

Finished Iron and Steel.—The week has been quiet in the Structural line. The most important contract taken by the leading interest was a building for a publishing house at Dayton, Ohio, requiring 1000 tons. The labor muddle in the building trade in this city is very discouraging. The point at issue is not serious, but it threatens to tie up the whole building industry indefinitely. If it should be settled quickly and in such a way as to promise to stay settled this year, the building trade would be brisk, but it must be settled soon. The Long Island power house of the Pennsylvania Railroad Company, taking 2500 tons, has been awarded to a local independent firm. Plates are quiet, but prices are maintained. Bids for the city ferryboats were opened on Saturday, but there were only three proposals, all from builders outside the city, and all above the appropriation. The Bar trade is very good, with buyers pressing for more rapid deliveries on contracts. We quote, at tidewater, as follows: Beams, Channels, Angles and Zees, 1.74½c. to 2c.; Tees, 1.79½c. to 2c.; Bulb Angles and Deck Beams, 1.84½c. to 2.05c. Sheared Plates in carload lots are 1.74½c. to 1.85c. for Tank, 1.84½c. to 2c. for Flange, 1.94½c. to 2.10c. for Marine and 1.94½c. to 2.50c. for Fire Box, according to specifications. Common Bar Iron, 1.35c. to 1.40c.; Refined Bars and Soft Steel Bars, 1.49½c.

Old Material.—The market is active and somewhat excited. Prices are up from 50c. to $1 per ton. Rerolling Steel Rails are in particularly good demand. Heavy Melting Steel Scrap is moving freely. Cast Scrap is in fair demand, but not so active as other classes of material. Prices are quoted as follows per gross ton, New York and vicinity:

Old Iron Rails	$17.00 to $18.00
Old Steel Rails, long lengths	16.00 to 16.50
Old Steel Rails, short pieces	12.50 to 13.00
Relaying Rails	17.00 to 18.00
Old Car Wheels	12.50 to 13.00
Old Iron Car Axles	18.50 to 19.00
Old Steel Car Axles	15.00 to 15.50
Heavy Melting Steel Scrap	12.50 to 13.00
No. 1 Railroad Wrought Iron	16.00 to 16.50
Iron Track Scrap	15.00 to 15.50
Wrought Pipe	11.00 to 11.50
Ordinary Light Iron	8.00 to 8.50
Cast Borings	6.00 to 6.50
Wrought Turnings	8.50 to 9.00
No. 1 Machinery Cast	12.50 to 13.00
Stove Plate	10.50 to 11.00

A. T. Shoemaker has been appointed export agent of the New Jersey Bridge Company, with office in the Flatiron Building.

The Warren Foundry & Machine Company will remove from 160 to 170 Broadway, New York, some time in April. They have occupied their present quarters for close to 25 years.

Metal Market.

NEW YORK, March 30, 1904.

Pig Tin.—The upward movement noted last week has ceased, and with a lagging of interest in the article the market has sagged considerably. The free shipments into the interior during the latter part of the month seem to have had the effect of filling all urgent requirements for the present. The situation at this writing is very quiet. Demand is light. At the close to-day the market stood as follows: Spot, 28.35c.; April, 27.87½c. to 28.25c.; May, 27.75c. to 28.25c. London £127 15s. spot and £128 futures. The arrivals so far this month amount to 3781 tons, and the afloats amount to 3047 tons, of which about 2000 tons will arrive within the next eight days. With these arrivals the stock on hand will be about normal.

Copper.—The market in this article has also quieted down considerably. Business is small and little interest is shown. Lake and Electrolytic are obtainable at from 12.75c. to 13c., and Casting is quoted 12.50c. to 12.75c. The London market is practically unchanged from last week at £58 and £57 10s., with Best Selected quoted £61 15s. The exports so far this month are again very large and promise to come fully up to our previous estimates. At this writing they aggregate 20,600 tons. With this month's figures the exportation during the last five months is brought up to an average increase above normal of about 8000 tons per month. The fact that the sending away of this greatly increased amount of the metal has not had any perceptible effect upon this market is generally commented upon in the trade. As one metal merchant puts it, "there seems to be an exhaustless oversupply here."

Pig Lead—Is steady and unchanged, with a fair demand for spot, which is somewhat scarce and is quoted at 4.60c. to 4.65c., from store. The quotations of the American Smelting & Refining Company are still based on 4.50c. for 50-ton lots of Desilverized, shipment within 30 days. St. Louis telegraphs 4.42½c. to 4.45c., and London cables a decline to £12 3s. 9d.

Spelter.—This metal is somewhat higher, with a considerable improvement in demand, and light offerings of spot. The market closed firm at 5.15c. to 5.25c. for spot, while St. Louis quoted 4.95c., and London has advanced to £22.

Antimony.—The market is firm and unchanged. At the close to-day Cookson's was quoted at 7¾c. to 8c.; Hallett's at 7¼c. to 7½c., and other brands at 6¼c. to 6½c.

Nickel.—This metal is firmly held, with the usual volume of business passing. Large lots are quoted at 40c. to 45c., and smaller quantities at 50c. to 60c.

Quicksilver.—The tone of the market is steady. Flasks of 76½ lbs. are quoted at $47 to $47.50. London quotes £8 5s.

Tin Plate.—The demand for Tin Plate is reported to have improved materially over last week. Some heavy contracts have been placed in the past week or two with the leading producer, and most of the independent mills are still reported to be filled up with orders for 30 to 60 days ahead. The American Tin Plate Company are declining orders for delivery before May. Quotations are unchanged on the basis of $3.45 per box for 14 x 20 100-lb. Cokes, f.o.b. mill, equivalent to $3.64, New York. Welsh Plates are unchanged at 11 shillings 4½ pence per box, f.o.b. Swansea.

L. Vogelstein, representing Aron Hirsch & Sohn of Halberstadt, leading German Copper merchants, has just issued an English translation of their Annual Copper Report for 1903.

The United Metals Selling Company announce that they will remove their offices on April 23 from 11 to 42 Broadway.

The Ore Dust Decision.—PITTSBURGH, Pa., March 30.—(*By Telegraph*).—At a board meeting of the Jones & Laughlin Steel Company, held in Pittsburgh on Tuesday afternoon, March 29, the recent decision of the Supreme Court in the ore dust case was discussed. It is said that the decision of the Supreme Court is final, and no appeal can be made to the United States Supreme Court because the case does not involve national interests. At the conclusion of the meeting an official statement of the matter was given out by B. F. Jones, president of the Jones & Laughlin Steel Company, as follows: "While we had expected that a different decision would have been rendered, we will endeavor to do everything in our power to comply with the mandate of the court. We have already expended large sums of money in investigating and testing all known inventions for the prevention of the excessive escape of ore dust. Up to the present time, however, these tests have been successful only in a degree." At this time it is not known definitely just what action will be taken by the Jones & Laughlin Steel Company in this important matter, but it is certain that the company will do all in their power, as they have in the past, to remedy the trouble. The company have spent large sums of money in an endeavor to abate the ore dust nuisance, but as yet a successful means of doing this has not been found.

The Tin Plate Wage Reduction.—PITTSBURGH, PA., March 30, 1904.—(*By Telegraph.*)—To-night the vote of the Amalgamated tin plate and sheet workers will be all in at the offices of the Amalgamated Association in Pittsburgh. A meeting of the Executive Board of the association will be held in Pittsburgh on Friday or Saturday of this week, when the result of the vote will be announced. While the Amalgamated officials refuse to give out anything to-day as to whether the vote is in favor of or against the reduction in wages, we learn from reliable sources that the tin plate workers have voted against the reduction. It is not known at this time what action will be taken by the association in this event, but it is probable that a number of the union tin plate mills will be closed. At other plants where the men voted in favor of the reduction, as they did at the Greer and Shenango works of the American Sheet & Tin Plate Company at New Castle, Pa., the plants will likely continue to operate at the reduced wage scale. The whole situation from the Amalgamated Association's standpoint is serious, and it will require the greatest diplomacy on the part of the officials of the organization to hold it together.

Pittsburgh Valve, Foundry & Construction Company.—PITTSBURGH, Pa., March 30.—(*By Telegraph*).—The large machine shop of the Pittsburgh Valve, Foundry & Construction Company, at Twenty-sixth street and Allegheny Valley Railway, was destroyed by fire on Tuesday evening, March 29. The pattern shop was located in the machine shop, and the drafting and superintendent's offices were also burned. The foundry was in a building isolated from the machine shop and was not destroyed. The concern will rebuild the machine shop and other departments as rapidly as possible, and probably on a larger scale than before. The loss is fully covered by insurance. The company anticipate very little delay in filling orders, as they will probably utilize one of their old shops in the downtown district until the plant is rebuilt.

Clowes Brass & Copper Mfg. Company.—The Clowes Brass & Copper Mfg. Company, who were recently organized by George H. Clowes of Waterbury, Conn., and other Eastern capitalists, have purchased the Toledo, Ohio, and Albany, Ind., plants of the Shelby Steel Tube Company, and will move them to a 25-acre site which they recently secured near Ellwood City, Pa. At this location, which is to be named Brass City, the company propose to erect structures in which will be installed the complete equipment of tube and rolling mill machinery. Mills will also be erected for drawing brass and copper rods and wire. With the equipment they have bought the company expect to be making brass and copper sheets, tubes, &c., by September 1.

Three of the seven hot mills in the Pittsburgh works of the American Sheet & Tin Plate Company, at New Kensington, Pa., have been started up. The other four mills will go on next week. The Pennsylvania works at New Kensington, which contain 6 hot and 6 cold mills, are to be started on April 11. Both these plants have been idle since last September. The men employed at them have voted almost unanimously in favor of the 20 per cent. reduction in wages of tin plate workers.

Allan P. Lovejoy, president of the Janesville Machine Company, Janesville, Wis., died suddenly on March 18, at his home in that town, at the age of 79 years. He was born in Wayne, Maine, and moved to Wisconsin in 1850. He started in Janesville in the contracting and building business, and later embarked heavily in the lumber business. He founded the Janesville Machine Company a number of years ago. Mr. Lovejoy had been a member of the Wisconsin State Legislature, and also served a term as Mayor of Janesville.

The New York Machinery Market.

NEW YORK, March 30, 1904.

Interest has been centered on several propositions of considerable magnitude which came to the front during the last week. So far as we have been able to learn, the negotiations of the week have not culminated in definite settlement. The largest of these projects had to do with the fulfillment of the Pennsylvania Railroad's New York tunnel scheme. The negotiations were chiefly carried on in Philadelphia. We understand that the problem of building and equipping the two immense power stations which are to be used in furnishing the electric power for operating the cars in the tunnel is now being considered with a view of making the necessary purchases. The report in the street has it that the contracts for the buildings have been awarded to Milliken Brothers of 11 Broadway, New York, but have not as yet been officially signed. It is also reported that a blanket contract covering the entire equipment has been awarded in a similar manner. This rumor has it that the order went to one of the large New York construction concerns. All of the parties concerned in the transaction are showing extreme reticence over the entire affair, which they will doubtless maintain until the matter is officially settled. There is still a great deal of interest being shown in connection with the awarding of the contracts for the iron work to be used in building the tunnel. This is also unsettled. Owing to the advancing tendency of the iron market it is said that present prices will be withdrawn at the end of this week, provided the matter is not settled before that time. The important bidders on this work are keeping in close touch with the machinery trade, as the award will necessitate large purchases of machinery on the part of the successful bidder. The castings must be furnished in their finished state, and this work will require a good deal of machinery. The finishing of the large cast iron rings comprising the tubes will necessitate the use of large boring and turning mills. The numerous cast iron screw piles on which the tubes will rest will also have a good deal of machine work put on them. They will be put down in short lengths, which will have to be threaded to be screwed together. These will be 18 inches in diameter, and when they reach the bottom of the river bed of silt, will be filled with concrete.

There is now considerable talk to the effect that the Pennsylvania Railroad may possibly furnish all of this material as well as all the machinery to be used in constructing the tunnel to the contractors who are to perform the work. It is said that the contracts read so as to provide that the Pennsylvania Railroad may furnish these materials at a certain figure. As the terms of the contract are being kept secret, the exact relations between the railroad company and the contractors are left open for conjecture. One opinion to which considerable credence is given is that both the contracts were taken on purely a percentage basis, the contractors agreeing to perform the work for a percentage of the gross cost of the entire work. That it is not straight out and out contract work obtains belief from the fact that bids are being asked by both the contractors and also by the Pennsylvania Railroad Company. In this connection we are advised on good authority that the Pennsylvania Railroad Company are now receiving bids on all the necessary apparatus. The contractors, we are informed, are entertaining propositions also for all of the machinery required in constructing the tunnel. The two which are receiving the most careful consideration are said to have been furnished by the Lidgerwood Mfg. Company of New York and the Wellman-Seaver-Morgan Company of Cleveland, Ohio.

It seems to be taken for granted that the power stations at each end of the tunnel will be equipped with Westinghouse turbo generators.

At the offices of Carr Bros., who are representing Pearson & Sons and the O'Rourke Engineering Construction Company, it is stated, that no contracts for machinery to be used in constructing the tunnels have been awarded as yet.

The offices of Carr Bros. have been removed from 61 to 32 Broadway, owing to the partial destruction by fire last Saturday of the former building. This firm were very fortunate so far as direct fire loss is concerned, however, and all of their catalogues, files and office equipment were saved from the fire. The business will continue uninterrupted at the new address.

While the Public Service Corporation of New Jersey are still claiming considerable attention of the power plant equipment trade, and are receiving bids on large quantities of such apparatus, we are informed that they will not make their purchases for several weeks at least. They have received bids on various lines of power generating apparatus to be added to their several plants throughout New Jersey, and are also working on a project looking toward the construction of a large, new station near Jersey City.

No new developments are reported in connection with the New York Edison and Brooklyn Rapid Transit matters.

In the machine tool trade one very important proposition is shaping up. We are advised on excellent authority that the American Locomotive Company, who, as we have previously noted, have acquired the plant of the Locomotive & Machine Company of Montreal, Canada, are planning to make extensive purchases of machine tools for this plant. It is said that $500,000 has been set aside for this purpose. While the Montreal plant has but recently been newly equipped with a magnificent lot of American machine tools, we are informed that the plant, as laid out at present, is not well balanced. The object of the new owners is not only to remedy this by the installation of additional tools, but to increase the capacity of the entire plant.

It is also probable that considerable additional equipment will be required by the Canadian Engineering Company who have acquired the plant of the defunct Cooper Company, at Rockfield, near Montreal, Canada. As this matter is now explained the Canadian Engineering Company are to be purely a manufacturing concern, building machinery for the Ingersoll-Sergeant Company, the Lidgerwood Mfg. Company and the Bullock-Allis-Chalmers interests. The new machinery, it is said, will be for the production of the added electrical line.

A large amount of machinery will be required by the Bullock Electric Mfg. Company, Cincinnati, Ohio, who are to build a 300-foot addition to their No. 2 shop. This new building will be two stories high, and will be used principally for the manufacture of street car motors. It will have an area approximately of 60,000 square feet. The company inform us that they cannot tell as yet exactly what new machinery they will have to purchase, as they have not finished the lay out of the shop, but it will be the usual equipment found in modern machine shops. The company now have extensive improvements to their plant at Norwood under way, and at the time their affiliation with the Allis-Chalmers Company, Chicago, was announced further extensions were decided upon.

The Southern Railway Company have placed orders for a fairly good sized lot of machine tools from their Washington offices within the last week. The tools are said to be for additions to their shops at Montgomery, Ala., and Columbus, Ga. A small amount was also purchased for the new shops at Spencer, N. C., but we are informed that the greater part of the equipment for these shops still remains to be purchased.

Large machine tool lists are being prepared by the New York Central authorities. It is reported that the tools are for installation in the shops at Depew, N. Y., and Springfield, Mass. The appropriations for the former equipment, we are told, have been made.

In the annual report of the Pittsburgh, Cincinnati, Chicago & St. Louis for the year ended December 31, 1903, President Cassatt says: "In order to meet the further expenditures that will be required upon your lines from time to time in the construction of additional main tracks, increase of terminal yards, shops and other facilities, the elevation of tracks of the company in Chicago, and to provide for the payment of underlying bonds of constituent companies maturing in the immediate future, the board authorized the creation of series 'F' of the consolidated mortgage bonds in the sum of $10,000,000, bearing interest at 4 per cent. per annum and running for 50 years from December 1, 1903, and of this series $2,000,000 have been issued."

The Canadian Pacific announces that it will build a large central power house at Fort William and equip it with two 750 horse-power engines, to be used to generate electric energy to drive all the machinery in the big grain elevators, as well as coal handling machinery.

The Northern Pacific, it is announced, has completed plans for making its South Tacoma car shops the largest in capacity on its entire system. General Manager Thomas Cooper, who is at Tacoma, has given out a statement in which he says that the company have found that they can construct cars at the Western end of their line as cheap as they can purchase them in the East, and that it has been decided to make large additions to the South Tacoma plant in order to handle the work.

A corps of engineers are now busy staking off the grounds for the new Santa Fé shops at La Junta, Col. The main building will be 158 x 400 feet. The improvements will cost in the neighborhood of $400,000, and the buildings will be of steel and brick, and will be practically fire proof. The machinery will be of the most modern make. This, it is said, will be the largest railroad shop west of Topeka.

Though they will rebuild a large portion of the machinery themselves, the Maritime Nail Company, Limited, St. John, New Brunswick, inform us that they require at the present time a line of machine tools to replace those lost in the fire which recently destroyed their works. The company intend to rebuild the works as soon as possible, and the new buildings will have a floor space of 35,000 square feet. They hope to have at least some departments in operation by July 1.

Later in the summer machinery, such as is used for making boilers and lighter equipment, will be required by the Economy Engineering Company, 150 Warren street, New York, who are to erect a plant in the early fall. The company were recently incorporated to manufacture chiefly the Neil W. MacIntosh patented combination feed water heater and water arch, besides steam appliances and specialties

which will tend to economize the running of plants. The officers are William Rosin, president; Neil W. MacIntosh, vice-president, and Oscar I. Lamberger, secretary and treasurer.

The General Electric, Westinghouse, Stanley Electric, Western Electric and the Bullock Electric companies are bidding on the equipment for the large hydraulic plant to be installed by the Georgia Railway & Electric Company, Atlanta, Ga. The power is to be derived from the big dam at Bull Sluice, on the Chattahoochee River, and the machinery to be purchased will amount to about $75,000.

Government Business.

Under bids opened March 1 for supplies for the Port Royal, Norfolk and Charleston navy yards, class 1, three motor electric overhead traveling crane, was awarded to the Morgan Engineering Company, Alliance, Ohio, at their bid of $3265.

Under bids opened March 8 for supplies for the New York Navy Yard, the following awards have been made:

Engberg's Electrical & Mechanical Works, St Joseph, Mich., class 1, one generating set, $545.

Drew Machinery Agency, Manchester, N. H., class 25, 30 portable rivet forges, $172.50.

The following bids were opened March 23 for supplies for the various navy yards:

Norfolk.

Bidder 1. Neville & Grubb, Portsmouth, Va.
2. Westinghouse Electric Mfg. Company, East Pittsburgh, Pa.
3. John D. Westbrook, Norfolk, Va.
6. S. M. Price Machinery Company, Norfolk, Va.
7. United Marine Supply Company, New York.
9. The Lumley-Dodson Company, Norfolk.
12. J. B. Kendall, Washington, D. C.
19. The Porter-McNeal Company, Norfolk.
20. Fox Bros. & Co., New York.
22. White Hardware Company, Norfolk.
25. General Electric Company, Schenectady, N. Y.
32. The Crocker-Wheeler Company, Ampere, N. J.
33. Manning, Maxwell & Moore, New York.
35. The Holzer-Cabot Electric Company, Boston, Mass.
41. James L. Belote, Norfolk.
55. Keystone Electric Company, Erie, Pa.
57. The D'Olier Engineering Company, Philadelphia.
58. Wm. Wirt Clark & Son, Baltimore, Md.
62. John B. Roach, Brooklyn, N. Y.
73. Drew Machinery Agency, Manchester, N. H.

Class 1. 11 electric motors—Bidder 35, $3209.50; 55, $3262; 57, $3279; 22, $3300; 32, $3324; 25, $3687; 2, $3787; 3, 5199.33; 73, $3295.

Class 26. 12 hydraulic jacks—Bidder 19, $492; 58, $508.10; 22, $509.40; 3, $510; 6, $510.30; 1, $516; 20, $520.98; 9, $522.90; 12, $525; 33, $534.60; 16, $537.60; 62, $544.80.

Class 28. 1 electric light plant—Bidder 55, $1745 and $1945; 25, $2275; 41, $2697.25; 7, $2731.50.

Portsmouth and Boston.

Bidder 1. Manhattan Supply Company, New York.
4. The Harold L. Bond Company, Boston, Mass.
12. The Drew Machinery Agency, Manchester, N. H.
14. The Westinghouse Electric & Mfg. Company, Pittsburgh, Pa.
18. Wheeler Condenser & Engineering Company, New York.
28. B. F. Sturtevant Company, Boston, Mass.
43. The Blake & Knowles Steam Pump Works, New York.
46. General Incandescent Arc Light Company, New York.
51. Keystone Electric Company, Erie, Pa.
52. Crocker-Wheeler Company, Ampere, N. J.
58. Marshall T. Davidson, Brooklyn, N. Y.
74. D'Olier Engineering Company, Philadelphia, Pa.
78. Pettingill-Andrews Company, Boston, Mass.
79. The Holtzer-Cabot Electric Company, Boston, Mass.
81. Warren Steam Pump Company, Boston, Mass.
83. Taunton Locomotive Mfg. Company, Taunton, Mass.
85. The General Electric Company, Schenectady, N. Y.
87. Morris Machine Works, Baldwinsville, N. Y.

Class 1. 4 45-inch steel plate fans and a quantity of spare parts for the same—Bidder 79, $1506.80; 74, $1780; 46, $1785.70; 28, $1993.90; 85, $2385.75.

Class 2. 1 No. 3 blower, with spare parts—Bidder 85, $247.03; 79, $317.10; 28, $319.45; 74, $326; 46, $391.75.

Class 3. 22 inclosed shunt wound electric motors of varying horse-power—Bidder 12, $4190; 52, $4512.75; 74, $4870; 79, $4932; 51, $5061.40; 46, $5067.25; 14, $5438; 85, $5890.

Class 51. One surface condensor—Bidder 81, $830; 18, $980; 83, $1180 and $1290; 58, $1175; 43, $1294.50; 12, $1579.

Class 52. Six vertical pumps—Bidder 58, $1545; 4, $2650; 81, $2670.

Class 53. One 4-inch double suction centrifugal pump—Bidder 87, $480; 12, $498; 4, $530; 1, $895.

Class 54. One double friction drum electric hoist—Bidder 4, $1250.

Class 55. One electric drill—Bidder 78, $710.

Class 56. To construct and erect fire proof stairs in building 114—Bidder 3, $825.

The Meeting of Southern Machinery Dealers.

The programme for the third annual convention of the Southern Supply and Machinery Dealers' Association, to be held at Old Point Comfort April 12 to 14, inclusive, has just been completed. A most interesting meeting is provided for, and the arrangements include excellent provisions for the entertainment of ladies who may accompany the members and guests. Aside from the regular line of topics which are usually touched upon in the interesting addresses at the meeting of this association, there is to be an open discussion on the subject "Is It Not to the Interest of the Manufacturers, as Well as to the Dealers, for the Manufacturers to Establish Minimum Selling Prices, and Should Not the Dealers Who Maintain Such Prices be Compensated by Some Rebate?" It is expected that some very interesting views will be presented by the members on this subject.

Cincinnati Machinery Market.

CINCINNATI, March 26, 1904.

There is quite a different atmosphere visible in machine tool circles than was in evidence a month ago. Conditions are gradually assuming a more satisfactory attitude, and tool men generally are very optimistic regarding future business. It is, of course, expected that this being Presidential year will have its usual effect on trade. Just why this should be so is a debatable question, but the fact remains notwithstanding. Agents and dealers generally have been disposing of large quantities of their stock, and this has naturally had its effect on the matter of production. Several of our largest concerns who have been running short force have within the past 30 days put many of their old men at work once more, and are gradually adding to this number each week.

The Japanese-Russian war has developed no special trade so far as can be learned, although rumor has it that several of our machine tool industries are busily at work on orders indirectly traceable to Japan.

The R. K. Le Blond Machine Tool Company are very well pleased at the manner in which trade has developed within the past three or four weeks. They have found it necessary to reinstate a number of their men, and a much better tone pervades the whole concern. For a long time their output has very materially exceeded the demand, and consequently there was an accumulation as the result. The reverse is now true, and they are able to dispose of their tools in a much more rapid and satisfactory manner. Foreign demand is looking up, and they report filling several very desirable orders for England, Switzerland and Belgium.

The Blymyer Mfg. Company have bought out the cane mill business of Brennan & Co., which is absorbed by the American Seeding Machine Company, and are consequently better able to handle domestic trade than ever. Mexico continues to be the chief market for sugar and coffee machinery, especially the former. The American investors and plantation owners in Mexico are vying with the Mexicans in putting in the best and most modern machinery, and this is adding to their trade considerably. Business with Colombia and Panama is also good, the troubles in these countries producing no serious effect on their orders. They are running overtime, and export work and inquiries are as numerous as ever, but are all calling for larger and better machinery than heretofore.

The Cincinnati Shaper Company report a much more satisfactory condition of affairs within the last 30 days. The railroads have been ordering tools to some extent, and they have recently supplied the new shops of the Southern Pacific Railroad in Nevada and Utah with their tools. They are receiving a few orders from South American points and from Porto Rico, but foreign trade, generally speaking, is very light.

The Lodge & Shipley Machine Tool Company say that business with them is better than at any time within the past three or four months. This is not to say that they have a normal trade, but it is becoming more so each week. While they are not employing their full quota of men, they are gradually increasing their force as requirements demand. The Southern markets are opening up and trade with this section of the country shows an increase. Their agents are at work figuring on several important deals that they hope will be productive of good results.

The McGovern Tire Setter Company are no exception to the rule and trade is exceedingly quiet. They are making some very marked improvements in their machines, which are giving general satisfaction. They are shipping one of their large hub banding machines to Columbus, Ohio; one to Waynesborough, N. C., and one to Chicago, Ill.

The Oesterlein Machine Tool Company note quite an improvement in conditions generally, and trade is much better than for several months. Orders are coming in more as stragglers and are not being received through their agents. They have scarcely any foreign business to speak of, although they have within the past few days shipped one of their milling machines to Holland and one to Germany. They are at work improving their plant as to details.

The John Steptoe Shaper Company are an exception to the general rule, and are employing more men than ever and running 60 hours per week. In order to increase their facilities they have just installed a new Lodge & Shipley 18 inch by 10 foot lathe and a new grinder polishing machine. They cannot make deliveries fast enough and have been compelled to cancel several orders on this account. They have orders booked for some time to come, and the outlook is very satisfactory indeed. Their latest foreign shipments are four machines to Stockholm, Sweden, and four to London.

The Rahn-Mayer-Carpenter Company are exceedingly quiet, with trade very spasmodic. They are receiving a few scattering orders through their agents, but are not very optimistic as to the future.

Cincinnati Machine Tool Company congratulate themselves upon the fact that trade is slowly but surely improving. March has shown a steady growth over February, and while they, like others, could do more, they feel encouraged with the present state of business and are quite hopeful for the future. Their new building on Spring Grove avenue has now progressed as high as the second story and presents a fine appearance.

"We are doing about as much business as we did last summer," is the way Smith & Mills put it. Trade is fairly good and they are running full force full time. They anticipate that when the war in the Far East is settled trade with those countries will become active and that Russia especially, where they formerly found a ready sale for their tools, will once more be on the alert and be in the market for tools of all kinds.

The Hamilton Machine Tool Works declare that the months of January and February were two of the best months they have had for more than a year. This is exclusive of the two large centers of trade, New York and Chicago. Their foundry, where they are doing considerable contract work, is running to its full capacity, and even then they have not room enough to take care of their orders. They are adding more floor space to their foundry in the way of cleaning sheds and have put more molders at work. March is reported to be not quite so good as the previous month, but a fair business is shown. Orders are not coming from any special section of the country, but are more in the nature of gleanings from all sections.

The Black-Clawson Company of Hamilton, manufacturers of paper mills, are doing more business than they were at this time last year. They are well supplied with orders and have all they can do at the present time. They are shipping a large consignment of paper mill machinery, consisting of more than 30 carloads, to the Ohio Boxboard Company, Rittman, Ohio; one large paper mill for Marion Paper Company, Marion, Ind., of 22 carloads; one machine for Scotland of 10 carloads, and for England of 25 carloads, as well as several smaller orders that are now under way. They are also manufacturers of ink mills, lard coolers and evaporating machinery of all kinds, for which they find a ready market. They are making extensive improvements to their plant by the addition of a new brick foundry building 55 x 265 feet, also a two-story brick office, pattern shop, drawing rooms and wareroom combined, 40 x 40 feet, a new power plant, 40 x 60 feet, with a battery of three Aultman & Taylor boilers; a 300 horse-power Hooven-Owens & Rentschler engine and a 250-kw. Bullock generator. Their foundry will be equipped with two 15-ton Niles cranes, and the several buildings being erected will be modern in all respects, with all machinery electrically driven, and when completed, will be the largest paper mill machinery manufactory in the world.

The Long & Allstatter Company, manufacturers of power punching and shearing machinery, of Hamilton, report a firmer tone developing in the business, with more general activity than for some months past. Their foundry is exceptionally busy, and they have been compelled to increase their force in this department. They are contemplating making some changes in the arrangement of their power plant, which will be in the nature of centralizing things, and allow them to distribute their power more evenly.

The Bentel & Margedant Company, manufacturers of wood working machinery, of Hamilton, were up to a short time since compelled to work nights to make deliveries within the specified time. This is at present, somewhat changed, and business is fairly normal only.

The Hooven-Owens & Rentschler Company, builders of Hamilton-Corliss engines, are not so active as they were several months ago. They have on their floors quite a number of engines in process of building, and their shops present a very busy appearance. They are working their full force of men, and their foundry department is especially crowded with orders. Among the recent shipments which have been forwarded we mention the following: One 22 x 38 x 48 heavy duty cross compound engine for Johnstown Passenger Railway Company, Johnstown, Pa.; one 32 x 48 heavy duty engine for N. & G. Taylor Company, Cumberland, Md.; one 26 x 52 x 48 heavy duty cross compound engine for Indianapolis & Eastern Railway Company, Greenfield, Ind.; one 28 x 56 x 48 heavy duty cross compound engine for the Bartlett Illuminating Company, Saginaw, Mich.; one 32 x 42 girder bed for Hugenot mills, Greenville, S. C.; one 24 x 48 x 48 heavy duty cross compound for the Indianapolis, Lebanon & Frankfort Railway Company, Lebanon, Ind.; two 22 x 42 heavy duty for Shreveport Traction Company, Shreveport, La.; one 14 x 26 x 36 heavy duty tandem for Colorado Canal Company, Bay City, Texas.

PERSONAL.

Robert M. Bird, a graduate of Lehigh University, succeeds R. C. Drinker as superintendent of the treating department of the Bethlehem Steel Company of South Bethlehem, Pa. Mr. Bird had previously been acting as Mr. Drinker's assistant.

Charles W. Bray, chief engineer of the American Sheet & Tin Plate Company, has been elected vice-president, to succeed W. M. Leeds, who recently resigned on account of ill health.

William Lloyd, formerly superintendent of the Monongahela works of the American Sheet & Tin Plate Company, has been appointed superintendent of the Humbert works, at South Connellsville, Pa., succeeding William N. Jones, receiver.

G. H. Shotter has been appointed superintendent and G. L. Glunt assistant superintendent of the 140-inch plate mill of the Carnegie Steel Company at Homestead.

William L. Saunders, vice-president of the Ingersoll-Sergeant Drill Company, New York, has been elected president of the company in succession to the late William R. Grace. George R. Elder, manager of the manufacturing department, has been elected third vice-president.

Edwin Reynolds of Milwaukee, consulting engineer of the Allis-Chalmers Company, celebrated the seventy-third anniversary of his birth on Wednesday, March 23. He was the recipient of hearty congratulations by officers and employees of the company with which he has been identified for so many years. The directors of the German-American Bank, of which Mr. Reynolds is president, presented him with a bouquet of 73 American Beauty roses.

On account of ill health Frank Bangert has resigned as superintendent of the tube department of the Wheeling Steel & Iron Company of Benwood, W. Va., to make his headquarters at Bellaire, Ohio. His successor will be W. Williams of Spang, Chalfant & Co., Pittsburgh, Pa.

W. W. Stephens, president of the Stephens-Adamson Mfg. Company, Aurora, Ill., is enjoying a vacation in the West.

Clyde M. Carr, secretary of Joseph T. Ryerson & Son, Chicago, returned March 29 from a six weeks' rest in Florida. L. M. Henoch, general sales agent, recently returned from an extended tour in Southern Europe.

E. T. Clarage, who has been manager of the Chicago branch of the Crucible Steel Company of America since the formation of the company, will sever the connection on April 1. Mr. Clarage was identified with the Crescent Steel Company eight years, after which he was manager of the Chicago branch of the Sanderson Bros. Steel Company for six years, taking the position of manager of the combined crucible companies upon their consolidation, nearly four years ago. R. D. Kuhn of Pittsburgh will probably be called to Chicago to fill Mr. Clarage's place temporarily.

William B. Dickson, second vice-president of the United States Steel Corporation, sailed for Europe to-day.

Very important oil developments are going on in Kansas.

Our Exports and Imports of Iron and Steel.

Our exports of iron and steel show some growth during the current year as compared with 1903, the total value for February, 1904, exclusive of iron ore, having been $8,761,257, as compared with $6,924,231 during the same month of 1903. It is only on a relatively few articles that tonnage figures are available, and these we have tabulated below:

Exports of Iron and Steel.

	February.		Two months.	
	1904.	1903.	1904.	1903.
Commodities.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	3,429	876	10,171	2,307
Scrap	1,443	197	3,345	383
Bar iron	1,687	267	3,687	645
Wire rods	513	1,416	820	1,876
Steel bars	704	3,671	1,739	5,792
Billets, ingots, blooms	26,205	317	43,389	354
Hoop, band, scroll	393	96	589	240
Iron rails	12	2	617	12
Steel rails	8,465	523	13,425	977
Iron sheets and plates	69	102	273	241
Sheet sheets and plates	808	807	2,231	1,278
Tin plates and terne plates	77	25	199	129
Structural iron and steel	2,950	3,114	5,290	5,813
Wire	8,042	7,646	15,626	14,060
Cut nails	737	775	1,525	1,292
Wire nails	1,786	1,778	4,103	3,485
All other, including tacks	238	127	409	311
Totals	57,558	21,739	107,438	39,195

A glance at this table shows that the really important increases are in steel billets and in steel rails.

The imports of iron and steel during February, 1904, were $3,313,010, as compared with $1,551,967 during the corresponding month of 1903. The available tonnage figures have been collected in the following table:

Imports of Iron and Steel.

	February.		Two months.	
	1904.	1903.	1904.	1903.
Commodities.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	3,841	45,187	14,653	155,866
Scrap	316	4,250	1,143	17,053
Bar iron	706	2,646	3,487	9,923
Rails	7,944	19,804	9,684	25,209
Hoop, band and scroll	82	117	716	166
Billets, slabs, bars, &c., steel in forms n.e.s.	1,514	20,151	3,374	58,860
Sheets and plates	1,032	206	1,781	1,980
Tin plates and terne plates	3,214	4,026	8,646	9,324
Wire rods	1,700	1,224	3,019	3,112
Wire and articles made from	324	252	774	489
Structural iron and steel*	1,512	....	2,053	....
Chains	35	45	77	79
Anvils	18	....	23	16
Totals	22,238	* 97,908	49,430	282,077

* Included among "All other" prior to July 1, 1903.

The most striking falling off, of course, is in pig iron, rails and steel billets, which together account for 212,224 tons during the first two months of the two years.

In the courts at Pittsburgh last week an amicable suit was tried to settle the value of the estate of the late Christopher Zug of Zug & Co., Limited, manufacturers of sheets and bars. Mr. Zug died January 13, 1902. He left to his daughter $7500 of the capital stock of Zug & Co., Limited, and the remainder of his interest to his son, Charles Zug. Money standing to his account and undivided profits were left to Mrs. Clarkson, Mrs. James H. Parker, Mrs. Edward A. Burdett and the children of Mrs. Harvey Childs. The executors of the estate filed an account showing Mr. Zug's credit balance to be $86,575.12; undivided profits, $47,974, and other items bring the total to $141,949.72. The legatees objected to the method of computing the values and the suit was entered. Considerable work has been done in preparing the evidence, which covers the methods in the iron and steel business and the great amount of rebuilding necessary in recent years.

CONTENTS.

	Page.
Accurate Drill Jigs. Illustrated	1
The Total Sulphur and Different Forms of Sulphur in Pig and Cast Iron	3
The New Rod Mill at Sydney, Nova Scotia	3
Tests of Motor Driven Roller Tables at Duquesne. Illus.	4
Manufacturing Prospects in Canada	8
Iron and Steel Production in France	8
A New Buffalo Hand Blower. Illustrated	9
Harris Simplex Molding Machine. Illustrated	9
The National Eight-Hour Bill	10
Improved Form of Overhead Tracking. Illustrated	11
The Standard Tin Plate Company	11
A Test of Ferro-Concrete and Ordinary Steel Construction	11
The Baraboo Iron Range	12
A Movement to Deal in Pig Iron Warrants	12
A Large Spur Gear Cutter. Illustrated	13
Measures in Aid of the Merchant Marine	14
A New Commercial Telegraph Company	14
A One-Belt Reversing Countershaft. Illustrated	16
Colorado Fluor Spar	17
Central American Notes	17
The Continuous Process in Stationary Open Hearth Furnaces. Illustrated	18
National Electric Company's New Offices	18
The National Metal Trades Association	19
An Inconsistency in Price of Light Steel Rails	24
Steel Theater Curtains. Illustrated	24
The Huge British Naval Programme	25
A Bevel Shear with Motor Drive. Illustrated	26
Turbines for Cunarders	26
A New Surface Grinder. Illustrated	27
The American Radiator Company's Litchfield Plant	27
The German Steel Syndicate	28
Metric Measurements in Manufactures and Engineering	29
National Metal Trades Association Notes	29
Summer School for Artisans	29
Editorial:	
Dealing in Pig Iron Warrants	30
The New Mexican Duties	30
National Expenditure	31
Correspondence	31
Scientific Shop Management	32
Engineers Visit the Frank-Kneeland Works	34
Manufacturing:	
Iron and Steel	35
General Machinery	35
Power Plant Equipment	35
Foundries	36
Bridges and Buildings	36
Fires	36
Hardware	36
Miscellaneous	36
Trade Publications	38
The Iron and Metal Trades:	
A Comparison of Prices	39
Chicago	39
Philadelphia	41
Birmingham	42
Pittsburgh	43
Cincinnati	44
Cleveland	45
New York	45
Metal Market	46
The Ore Dust Decision	46
The Tin Plate Wage Reduction	46
Pittsburgh Valve, Foundry & Construction Company	46
Clowes Brass & Copper Mfg. Company	46
The New York Machinery Market	47
The Meeting of Southern Machinery Dealers	48
Cincinnati Machinery Market	48
Personal	49
Our Exports and Imports of Iron and Steel	50
The Coxey Steel & Silica Sand Company	51
An Important Ore Dust Decision	51
An Order for One Thousand Steel Cars	51
Iron and Industrial Stocks	51
Notes from Great Britain	52
Hardware:	
Condition of Trade	53
Notes on Prices	53
Illinois and Chicago Screw Companies Consolidate	55
The Atlanta Conventions	55
Col. James R. Nutting	55
Factory Cost and Business Methods	56
The New York and New Jersey Hardware and Iron Association	57
Logan-Gregg Hardware Company	57
Hardware Club	57
Rhode Island Hardware Dealers' Association	57
Death of W. H. Stanton	57
Among the Hardware Trade	58
Texas Hardware Jobbers' Association	58
Australian Notes	58
Trade Items	58
National Retail Hardware Dealers' Association. Portraits	59
Requests for Catalogues, &c.	63
Price-Lists, Circulars, &c.	63
California State Retail Hardware Association. Portraits	64
British Letter	73
German Notes	74
Miscellaneous Notes:	
Novel Pocket Knives	75
Hollow Point Bullet Cartridges	76
Colored Celluloid Thumb Tacks	76
The Improved Putnam Nail	76
Ever Ready Dry Battery. Illustrated	76
Wagner Mfg. Company's Ice Chippers. Illustrated	76
Classic Food Chopper. Illustrated	77
Malleable Iron Washers. Illustrated	77
Reliable Store Ladders. Illustrated	77
Power Bench Lawn Mower Grinder. Illustrated	78
Automobile Cycle Skate. Illustrated	78
Moyer's Wire Stretcher. Illustrated	78
Current Hardware Prices	79
Current Metal Prices	86

The Coxey Steel & Silica Sand Company.

PITTSBURGH, Pa., March 30.—(*By Telegraph*).—The courts have ordered the steel casting plant of the Coxey Steel & Silica Sand Company, at Mount Vernon, Ohio, closed, and it will not be run again by the receiver, but will await either public or private sale. The courts have ordered the receiver to obtain the best possible offer for the plant at private sale, and, failing to secure this, the courts will order the plant sold at public sale. In connection with the receivership is the sand plant of Jacob S. Coxey, at Massillon, Ohio, from which he has been shipping for the past 20 years his silica sand. This is involved in the receivership, and must be sold with the steel casting plant.

An Important Ore Dust Decision.—The Pennsylvania Supreme Court, sitting in Philadelphia, rendered a decision on Monday, March 28, directing that an injunction be issued perpetually enjoining the Jones & Laughlin Steel Company of Pittsburgh from such operation of their furnaces located in the Fourteenth Ward of Pittsburgh as to produce clouds of ore dust that would injure surrounding property. E. R. Sullivan complained that the company by tearing down three furnaces and replacing them with four large new ones, using in them a fine ore dust, caused the stacks of the plant to emit clouds of dust which injured his property. The Supreme Court also, among other things, says that the right of the steel company to operate in Pittsburgh must be conceded, but they cannot so rebuild and operate their furnaces as to actually destroy homes and other property in a residential section of the city. The court stood four to three, Chief Justice Mitchell and Justices Fell and Thompson dissenting.

An Order for One Thousand Steel Cars.—PITTSBURGH, Pa., March 30.—(*By Telegraph*).—The Pressed Steel Car Company of Pittsburgh have received an order from the Pittsburgh & Lake Erie Railroad for 1000 steel cars of the gondola type, which will have a capacity of 90,000 pounds each.

A, Morris Hall, who has been identified with the manufacture of drop forgings of all descriptions for the past 14 years, lately as general manager of the present Keystone Drop Forge Works, who recently removed their plant from Philadelphia, has become connected with the Transue & Williams Company, Alliance, Ohio, as their general Eastern sales agent, with offices at 1030 Land Title Building, Philadelphia, Pa. These parties are manufacturers of drop forgings of all kinds and are equipped for work of heavy character.

The Frankford Steel Company, manufacturers of tool and spring steel, Frankford, Philadelphia, who recently went into liquidation, is being operated by the receiver. It is proposed either to sell the plant as a whole or reorganize the company. The plant had recently been fully equipped and crucible melting furnaces with a capacity of 2500 tons of steel were installed.

The Kenworthy Engineering & Construction Company of Waterbury, Conn., have recently closed a large contract with the Phillips Insulated Wire Company of Pawtucket, R. I., for furnace equipment, consisting of a large billet heating furnace, copper wire scaling furnace, charging and scaling elevators, chimneys, &c.

The plant of the Standard Steel Car Company, at Butler, Pa., which has been closed down for nearly a month, has started up in the punching, shearing and pressing departments. It is expected that within a short time the entire plant will be on in full.

JOHN FREDERICK POLSEY, president of the Boston Blower Company, Hyde Park, Mass., died March 21, aged 53 years. Mr. Polsey was connected with the blower manufacturing industry for many years and was well known and much respected in the trade.

Iron and Industrial Stocks.

Spceulation in industrial stocks has been overshadowed by the interest taken in Northern Securities developments and the heavy transactions in the stocks of the railroad companies affected by the division of the holdings. Fluctuations in industrials have, therefore, been small, with some stocks neglected for days at a time. United States Steel stocks were the most active, ranging during the week from 77 to 11½ on the common, 57⅛ to 58⅞ on the preferred, and 74⅛ to 75 on the new 5 per cent. bonds. Some weakness was shown in the preferred on Tuesday under reports of a reduction in the dividend for the quarter, on which action is shortly due. Last sales of active stocks up to 1.30 p. m. on Wednesday were as follows: Car & Foundry common 19¾, preferred 71⅞; Locomotive common 21¼, preferred 82⅞; Colorado Fuel 28¼; Pressed Steel common 29½, preferred 69; Railway Spring common 20½, preferred 74; Republic common 7⅜, preferred 43⅞; Tennessee Coal & Iron 38¼; United States Steel common 11⅛, preferred 58⅛, new 5's 74¾.

The Nova Scotia Steel & Coal Company.—President John F. Stairs of the Nova Scotia Steel & Coal Company, in his annual report says: "The volume of business transacted by the company during the year shows satisfactory increase over 1902, which was then the largest in the history of the company. The quantity of iron ore sold was much less than during the previous year. The quantity to be sold during 1904 will be still further reduced. The company's policy is to reduce the sales of ore as the output of coal is increased." The company have issued their annual report for the year ended December 31, 1903, which compares as follows:

	1903.	1902.	1901.
Gross profits	$859,397	$609,935	$508,937
Interest on bonds	150,000	150,000	93,238
Balance	$709,397	$459,935	$415,699
Preferred dividend	82,400	82,400	82,400
Balance	$626,997	$377,535	$333,299
Common dividend	246,804	191,115	123,600
Balance	$380,193	$186,420	$209,699
Reserve fund	75,000	60,000	100,000
Balance	$305,193	$126,420	$109,699
Sinking fund, &c	72,700	25,000	.....
Surplus	$232,493	$101,420	$109,699
Previous surplus	453,149	351,729	242,030
Total surplus	$685,642	$453,149	$351,729

Dividends.—The Manufacturers' Light & Heat Company, Pittsburgh, have declared the regular quarterly dividend of 1½ per cent., payable April 20.

The Ohio Fuel Supply Company have declared the regular quarterly dividend of 2½ per cent., payable April 15.

E. W. Bliss Company have declared quarterly dividends of 2½ per cent. on the common and 2 per cent. on the preferred stock, both payable April 1.

American Locomotive Company have declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable April 21. Books close March 31, and reopen April 21.

Westinghouse Electric & Mfg. Company have declared the regular quarterly dividends of 2½ per cent. on the preferred assenting and non-assenting stocks, payable April 11.

The Philadelphia Company of Pittsburgh have declared the regular quarterly dividend of 1½ per cent., payable May 2.

The Mark Mfg. Company, Chicago, have acquired the plant of the Eastern Tube Company at Zanesville, Ohio. This plant has an equipment of three lap weld furnaces, with a total capacity of 350 tons of pipe per day, and all machinery for making sizes from ½ to 16 inches, inclusive. The plant was built four years ago at a cost of nearly $1,000,000. The Mark Mfg. Company have not definitely decided what to do with the new plant, but if they operate it it will give them a daily capacity in their Chicago and Zanesville plants of 500 tons of pipe per day, the Chicago plant having a capacity of 150 tons besides their lines of pumps, plumbing tools and specialties.

The Hendee Machine Company of Torrington, Conn., have disposed of their entire machine tool business to the Prentice Bros. Company of that city. The Johnson & Prentice Company began to operate their machine shop less than a year ago, and have manufactured a few sizes of upright drills and a cutting off machine. It is understood that the company's machine tools will be sold.

The men of the Anderson tin plate works of the American Sheet & Tin Plate Company, at Anderson, Ind., have voted against accepting the 20 per cent. reduction.

Notes from Great Britain.

The Markets.

LONDON, March 18, 1904.—There cannot be any doubt that the absence of American and German competition is proving of immense value to British makers. It may be said that for some weeks past there has practically been no trade done either with America or Germany. The result of this has been that more substantial contracts with heavier tonnage have been booked during the past few days than in any period during the past six or nine months. Curiosity is still rife as to why both the Americans and the Germans are off the market.

The proposed selling contract issued by the United States Steel Products Export Company is so arbitrary in its terms that one almost thinks that at the present moment the American mills are not anxious to cultivate this market. It is certain, at all events, that British buyers will not submit to the terms imposed, which are roundly declared to be unjust and inequitable. The proposed agreement has been the talk on the exchanges both in London, Birmingham, Manchester and elsewhere. Then, again, the absence of German competition is put down to the establishment of the German Steel Syndicate, who apparently are marking time until they finally decide upon a fixed policy in regard to foreign trade. If this be so, the cessation of German activity on the British market is only transitory, and we may look for lively developments when a German policy is deliberately decided upon and energetically followed up. Another consideration weighs with buyers. According to the *Weserzeitung* the German Steel Trust is about to open negotiations with the British and American steel companies to see if some scheme cannot be arranged to delimit the respective fields of interest of all companies in the world's markets, so as to obviate existing competition.

Meantime, the unmarked bar makers are loud in their assertion that if they are not losing money they are not making any, and it is just possible that before long some attempt will be made slightly to lever up prices to a remunerative level. There is some talk now of the Unmarked Bar Association meeting at an early date, but to raise standard prices will be a very difficult, if not an impossible, task. None the less, a better tone prevails, and there are inquiries for large quantities of bars. In other departments there is no important change to record. In the sheet branch both black and galvanized things are as they were, but gas strip makers are in receipt of a good number of orders, and their mills are more fully occupied. Hoops and thin strip show no improvement.

Meantime the improvement in the northeastern shipping industry is maintained. It is stated that since the beginning of the year no fewer than 70 new vessels have been booked on the Tees and Tyne. One result of this is that wages are not to be reduced as was the original intention, while the Moor Iron Works, at Stockton-on-Tees, which were closed a year last October on account of trade depression, are shortly to be reopened. It would appear as if the situation in Belfast is not as satisfactory as on the northeast coast. The Belfast master shipbuilders at the beginning of the present month served a notice on the Boiler Makers' and Iron Shipbuilders' Society of a proposed reduction of 5 per cent. in piece work rates, the reduction to come into operation on and after April 1. This week a meeting of the men was held in Belfast, and it was decided to accept the reduction. This is the second within six months, affecting between 4000 and 5000 men.

Profits and Dividends.

At this season of the year not the least interesting items are those relating to profits and dividends of large or typical British iron and steel companies. This week there is quite a crop of them.

Cammell, Laird & Co., Sheffield, formerly known as Cammell & Co., pay 7½ per cent., which marks a shrinkage. Previous dividends have been as follows: For 1898, 15 per cent.; 1899 and 1900, 17½ per cent., each year: 1901, 15 per cent., and for 1902, 10 per cent.

The Northeastern Steel Company, Middlesbrough, report profits on the year's working of £22,275, and after providing for interest on debentures and loans, £4128 is carried to next account. The directors describe the result as disappointing, as during the first half of the year, with a fair order book and a good demand for finished sections at remunerative prices, the outlook was such as to justify the expectation of a considerable improvement on the preceding year. The operations during the last half of the year resulted in a loss instead of a profit.

Bell Brothers, Middlesbrough, secured a profit last year of £101,175. A dividend of 7 shillings per share is paid, with 6 per cent. on the preference.

Hadfield's Steel Foundry Company, Limited, in four years have paid back on their ordinary shares something like 90 per cent., and yet to-day they have £224,000 standing to the reserve fund, or about 50 per cent. of the total capital. There are no debentures, and the company possess 79 acres of freehold land, forming one of the best sites in Sheffield. The intrinsic value of this land is already nearly double what was paid for it. R. A. Hadfield, the managing director, who is well known in America, will be congratulated upon such satisfactory results.

British and American Tram Points.

At a meeting this week of the Coventry City Council attention was called to the resolution of the General Works Committee, expressing regret that British firms were practically debarred from tendering for the supply of rails, &c., for use in the tramway extensions of Coventry. It appears that Hadfield's Steel Foundry Company took objection to the decision of the Council to buy the tram points from America. The vice-chairman of the General Works Committee said that the company should have moved in the matter earlier. They knew a considerable time ago that these rails were being advertised for, and they took no action whatever until the day the tenders were going in, when they saw the city engineer and endeavored to get things altered. The position of the General Works Committee was this: So long as the rails were kept up to the proper standard, they had no further control over them. It also appeared that the quotations for the same things from English firms were considerably in excess of the prices of American ones.

S. G. H.

The Princess Estates Company, Limited, Niagara Falls, Ontario, have been incorporated with a capitalization of $5,000,000, to develop the Canadian side of the river industrially from the Falls to Welland River. The company have acquired holdings aggregating 2500 acres in the most desirable locations for manufacturing sites. The property abuts on the Welland River and borders the Government land on the Canadian side to Queen Victoria Park. G. H. Dunbar of Buffalo is president.

An American vessel has just made a record for a long voyage, using oil for fuel. The steamship "Nebraskan" reached New York on March 27, after a voyage of 12,724 nautical miles from San Diego, Cal., steaming all the way under power generated by California crude oil. The voyage occupied 51 days 7 hours, and the average speed was 10.35 knots. Much time was saved in the avoidance of stops for coaling. Three furnacemen did the work of 12 stokers.

At Pittsburgh, in the suit of the West Penn Foundry & Machine Company, Avonmore, Pa., dealers in rolling mill machinery, against the St. Louis Plate Glass Company, an action to recover the amount alleged to be due for supplying machinery, the defendants have filed answer denying any amount being due, and setting up a claim of $24,027.94, alleged to be due as damages and expenses for delay caused by the plaintiffs not meeting the specifications fully.

From 1894 to 1902 the freight traffic of the United States, expressed in terms of the number of tons carried 1 mile, increased from 80,335,000,000 to 157,289,000,000, a gain of 96 per cent.

Rossiter MacGovern & Co., Incorporated, of New York have removed their St. Louis branch office from the Missouri Trust Building to their factory building, Papin street and Compton avenue, St. Louis.

HARDWARE.

WHILE manufacturers are generally close and careful buyers, there is a wide diversity in the attention given by retailers to the purchase of their goods. Many of them are painstaking and systematic in their buying, recognizing the importance of this department of their business, and by the attention they give to it having a considerable percentage which helps materially in their efforts to make a satisfactory profit. That it is the duty of a merchant to purchase his goods at as advantageous prices and terms as are within his reach is a statement which needs no argument. If he has not the instinct to do this he has probably mistaken his calling. There are, however, many who excuse themselves from attention to this part of their business because their purchases are, when separately considered, of comparatively small amount, and the saving of 2½ or 5 per cent. does not seem to them a very important matter. Any neglect in the care given to their buying they can, they fancy, make up for in the selling prices. If their competitors are as negligent as themselves they avoid for a time at least going to the wall under the stress of competition. They are, however, losing opportunities for obtaining additional profit and for making for themselves a better position in the trade. Their carelessness in this regard ranks them as slipshod and unbusinesslike. The prospect of their growth and development is unpromising. They have not the commercial spirit and are not likely to make any large success. The poor buyer is almost invariably a poor merchant.

Merchants in every line of trade are only too familiar with the appeals made by their customers for the purpose of levying tribute from them in one form or another for the benefit of some fair or charitable object. Sometimes the benefaction is to take the form of a contribution of money or articles, but more frequently an advertisement is solicited in some programme or other publication, the result of which in securing business would in all probability be insignificant. This is a matter against which retail merchants have often protested, and for their mutual protection those in a community not infrequently reach an understanding among themselves that they will not encourage with their patronage any such solicitations. There are, however, not a few instances in which retail merchants make their application for similar contributions from the jobbers or manufacturers from whom they purchase goods. In some cases, indeed, the matter goes a step further. We have before us a circular appeal from a social organization, addressed to a jobbing house, in substance as follows:

> *Your name has been furnished us by ....., who is a customer of yours. We would appreciate anything in the way of merchandise you may contribute to the cause set out below, and will by publication make your favor known to the trade and people of our county. We are going to hold a fair, and desire your assistance as above to make it a success. Thanking you in advance, we are, &c.*

Here the local Hardware merchant apparently gave the names of jobbers and manufacturers from whom he purchases goods to the enterprising committee who sent out the foregoing appeal. Parties receiving such appeal, after calling their customers' attention to the impropriety of his part in the transaction, would naturally consign the circular to the waste basket.

Condition of Trade.

The advent of springlike weather is having its natural effect upon business and the distribution of Hardware. The stores throughout the country report an increased demand for many lines of goods, notably house furnishing articles and those connected with the spring overhauling of houses and with agricultural and garden operations. Mechanics' Tools also are moving more freely. The general indications point to a fair amount of building, especially where labor difficulties are not anticipated, and the territory exempt from these disturbing influences fortunately covers a very large proportion of the country. The jobbers are not buying a great many goods at this time, their stocks being apparently sufficient for their needs. Manufacturers in many lines are able to turn out their products in greater quantities than the trade immediately require, and not a few of them are accumulating stocks. This they do without serious apprehension, anticipating, as a result of the disposition which has prevailed on the part of the trade for some time past to purchase very conservatively, that the demand will continue longer than usual in the form of relatively small but frequent orders. In a few lines, as, for example, Wire and Wire Nails, the demand is very gratifying and delay is experienced in execution of orders. The tone of the market is reasonably firm. Slight concessions are obtainable on some lines, but the market is, on the whole, without any except minor declines, which are regarded as healthful and perhaps desirable.

Chicago.

(*By Telegraph.*)

Floods all over the West have somewhat interfered with the growing demand for Hardware products, though the market is an active one, notwithstanding this drawback. Prices have been, or soon will be, advanced on Picks and Mattocks and on Chisels. Sheets have been advanced from $1 to $2 per ton for both blue and box annealed. Galvanized Sheets are also a little firmer in tone. Bars, Nuts, Bolts, Rivets, Spikes, Lag Screws and similar lines are all stronger in tone. One manufacturer of Wire Cloth has raised his price 10 cents. The visible supply of Cloth, however, is very light, and a warm spring and summer will doubtless result in advances by the jobbers. Some manufacturers of Lawn Mowers have given their customers notice that they will take no further orders for this season. Garden Tools and Shovels are in excellent demand. Considerable business is being booked already for such lines as Axes, Stove Boards, Stove Pipe and Elbows, Coal Hods and the like. All Wire products are exceptionally firm in tone, with the demand fully up to the ability of mills to supply. The advance on Cut Nails does not seem to have lessened business in that commodity to any considerable extent. The demand from the West and Southwest for Poultry Netting is greater than has been known in the marketing of this commodity. While manufacturers might have advanced prices they continue to hold them as before.

NOTES ON PRICES.

Wire Nails.—Deliveries are delayed owing to mills being unable to obtain Steel promptly, also because there is a pronounced shortage of cars. While orders have accumulated so that manufacturers are generally behind, new business is being received in large volume. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$1.90
Retailers, carload lots	1.95
Retailers, less than carload lots	2.05

New York.—Demand is fair, but somewhat restricted by the unsettled conditions of labor. Quotations are as

follows: Single carloads, $2.10; small lots from store, $2.20.

Chicago, by Telegraph.—From all over the West orders for Wire Nails continue to come in in large volume, a smaller proportion from the city of Chicago in proportion to its population than from any other part of the country. Notwithstanding the fact that mills are crowded to the guards with orders, prices have not been advanced, remaining as follows: Carload lots to jobbers, $2.10 per 100 pounds; less than carloads to jobbers, $2.15 per 100 pounds; carloads to retailers, $2.15 per 100 pounds; less than carloads to retailers, $2.25 per 100 pounds, all f.o.b. Chicago.

Pittsburgh.—Buyers of Wire Nails are making loud complaints about slow deliveries, some mills having orders on their books which should have been filled two months ago. This condition is due to heavy demand, shortage of cars and in some cases to inability of the mills to get prompt deliveries of Steel. Spring trade in Wire Nails this year will be very much heavier than last year. Prices continue very strong and there is some talk of another advance, but nothing official about this has been given out. We quote Wire Nails at $1.90 in carloads to jobbers, $1.95 in carloads to retailers and $2 to $2.05 in small lots to retailers, all f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days, plus actual rate of freight to point of delivery.

Cut Nails.—The advance of 5 cents per keg, made by the manufacturers last week does not appear to have affected the demand, which continues fairly good. Quotations are as follows for Steel and Iron Nails, in all quarters: $1.75, base, in carloads, and $1.80 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms 60 days, less 2 per cent. off in 10 days.

New York.—Jobbers have advanced the price of Nails to correspond with the advance made by the Cut Nail Association last week. There is an improved demand, as compared with a few weeks ago. Some sizes are temporarily scarce in this market, especially 8-penny Cut. Quotations are as follows: Carloads on dock, $1.89½; less than carloads on dock, $1.97½; small lots from store, $2.05.

Chicago, by Telegraph.—The advance of $1 per ton in Cut Nails does not seem to have affected the volume of buying one way or another to any marked degree. Demand for Iron Nails is in excess of the supply, and makers of genuine Iron Shingle Nails who will actually deliver Nails on orders should have no difficulty in securing a premium even above the advanced prices. Prices on both Iron and Steel Nails are as follows: Carload lots, Chicago, to jobbers, $1.91½, base; less than carloads, $1.96½. Retailers and large consumers pay 10 cents per 100 pounds above jobbers' prices. Jobbers sell at from $2.10 to $2.30, base, f.o.b. Chicago warehouse, according to customer, size of order, &c.

Pittsburgh.—The Cut Nail Manufacturers' Association, at their meeting last week, advanced prices of Iron and Steel Cut Nails 5 cents a keg. Demand is fairly heavy, and the mills have a moderate amount of orders on their books. A good many of these orders were placed some time ago when prices were slightly lower than they are now. We quote Steel and Iron Cut Nails at $1.75, base, in carload lots, and $1.80 in less than carloads, f.o.b. mill, terms 60 days, less 2 per cent. off in 10 days.

Barb Wire.—Heavy demand continues, and shipments are delayed owing to car shortage and the oversold condition of the mills. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$2.20	$2.50
Retailers, carload lots	2.25	2.55
Retailers, less than carload lots	2.35	2.65

Chicago, by Telegraph.—From the Ohio, Mississippi and Missouri valleys and from the Far West the demand for Barb Wire is unabated. The requirements of the Southern States have been pretty well supplied, for the present time at least. While the growing favor of Woven Fencing is doubtless cutting into the demand for Barb Wire, there is enough new territory being fenced in to keep the mills busy to their utmost capacity. While it would be easy for manufacturers to maintain higher prices, they remain unchanged as follows: Carload lots, Painted Wire, $2.40; Galvanized, $2.70; to retailers, carload lots, Painted, $2.45; Galvanized, $2.75; to retailers, less than carload lots, Painted, $2.55; Galvanized, $2.85; Staples to jobbers, $2.25 for Plain and $2.65 for Galvanized, with 5 cents advance to retailers.

Pittsburgh.—There is no falling off in demand for Barb Wire, which is still beyond the ability of the mills to furnish promptly, and consumers are having trouble in getting deliveries of Barb Wire as fast as wanted. This is due to car shortage and congested condition of order books. Prices are very firm, and another advance at an early date would not be surprising. Quotations are as follows, f.o.b. Pittsburgh; terms, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carloads	$2.20	$2.50
Retailers, carloads	2.25	2.55
Less than carloads	2.35	2.65

Smooth Fence Wire.—The situation shows no improvement, as far as deliveries are concerned. Mills are unable to keep abreast of their orders, and to this is added their inability to obtain cars for shipping Wire. Quotations are as follows, f.o.b. Pittsburgh; terms, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.80
Retailers, carloads	1.85
Less than carloads	1.95

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base.	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago, by Telegraph.—The trouble is not to get business, but to supply the extraordinary demand for Smooth Wire for fence and other purposes. Fence mills are running night and day and are far behind their orders, and it requires the utmost efforts on the part of these mills to keep on hand sufficient quantity of Wire to supply their machines. Prices have not been advanced as yet, remaining as follows: Smooth Fence Wire, sizes 6 to 9, $2 per 100 pounds in carload lots to jobbers, f.o.b. Chicago; $2.05 per 100 pounds to retailers in carload lots, and $2.10 in less than car lots.

Pittsburgh.—The mills are considerably behind on orders and do not seem able to catch up, with the result that a few mills are refusing to book any more business except for late delivery. The car shortage, together with extraordinarily heavy demand, are responsible for this condition. Prices are firm, but without change. We quote as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent discount for cash in 10 days: Plain Wire, $1.80, base, for Nos. 6 to 9, in carloads to jobbers, and $1.95 to $2 in small lots to retailers; Galvanized, 30 cents extra for Nos. 6 to 14.

Sheet Zinc.—Under date of March 22, Matthiessen & Hegeler Zinc Company, La Salle, Ill., announce the price of Sheet Zinc as $6 per 100 pounds in 600-pound casks, subject to the usual discounts.

Cartridges with Hollow Point Bullets.—The Union Metallic Cartridge Company, Bridgeport, Conn., and 317 Broadway, New York, are introducing a special Rim Fire Cartridge with Hollow Point Bullets, in both Black and Smokeless Powders, for small game, such as rabbits, squirrels, &c., in the following styles, viz.:

	Per 1000.
.22 short, hollow point bullets, black powder	$5.50
.22 long, hollow point bullets, black powder	6.50
.22 long rifle, hollow point bullets, black powder	6.50
.25 Stevens, hollow point bullets, black powder	14.50
.22 short, hollow point bullets, smokeless powder	6.75
.22 long, hollow point bullets, smokeless powder	8.00

They are subject to the same discounts and terms as the regular Rim Fire Cartridges and list, but are 50 cents per 1000 higher than the ordinary Cartridges, the discount being 50 per cent. on all but the .22 short smokeless, which is 50 and 15 per cent.

Hatchets.—It is expected that the advance in the price of Hatchets will be effected by a change in the discount, the list prices remaining as before. Manufacturers, however, have not as yet made general public announcement of the advance or the precise form in which it will be communicated to the trade.

Bright Wire Goods.—The market in this line is quite irregular at the present time and some low figures are developing.

Axes.—The contemplated advance of 25 cents per dozen in the price of Axes goes into effect April 1. The impression among the trade is that the announcement of this advance did not result in securing as many orders as were hoped for. This is accounted for in part by the fact that many of the trade have carried over a good many goods from the past season.

Cordage.—The volume of business being booked by manufacturers for Rope is fair, and prices appear to be maintained. Quotations on the basis of 7-16-inch diameter and larger are as follows: Pure Manila, 12 cents per pound, with a rebate of ¼ to ½ cent per pound to largest buyers; other grades of Manila, 10 to 11 cents, according to quality; pure Sisal, 9¼ cents, with ¼ cent rebate to largest buyers; Mixed Sisal, 8 cents per pound, with no rebate.

Binder Twine.—There is reason to suppose that a considerable volume of business has been booked on no price contracts, while in the West it is reported that small lots of Sisal and Standard have been quoted at 10½ cents, this price being guaranteed against the price which shall be made by the International Harvester Company. There appears to be more willingness on the part of sellers, outside the above company, to embody prices in contracts to secure orders, as the advent of spring has increased the desire of some buyers to cover their future requirements, at least in part. The impression prevails that prices will not be announced by the largest factor until a later date than last year.

Glass.—The Window Glass situation remains unchanged by the new wage scale, and is reported as giving general satisfaction where it has been adopted. It is referred to as not being a reduction in wages, but in accordance with scales which have been acceptable to workmen and manufacturers. At factory, prices range from 90 to 90 and 5 or 90 and 10 per cent. discount for carload lots, according to the necessity of the manufacturer to dispose of his output.

Oils.—*Linseed Oil.*—The month has proved an exceeding quiet one in the Linseed Oil market, being referred to as the dullest month manufacturers have experienced for four or five years. There is a hopeful feeling that demand will improve when the weather becomes more settled. Prices quoted 1 cent less than those given below for State and Western have failed to attract buyers. Quotations are as follows: City Raw, in lots of five barrels or more, 42 cents; in lots of less than five barrels, 43 cents per gallon; State and Western Raw, 39 to 41 cents per gallon. Boiled Oil, the usual 2 cents advance per gallon over Raw.

Spirits Turpentine.—During the week under review the market declined about 2½ cents per gallon, and later advanced 1 cent, owing to light holdings at this point. Business has been confined to small lots. Quotations, according to quantity, in this city, are as follows: Oil barrels, 59 to 59½ cents; machine made barrels, 59½ to 60 cents.

ILLINOIS AND CHICAGO SCREW COMPANIES CONSOLIDATE

AFTER extended negotiations the Illinois Screw Company of 40 South Canal street, Chicago, have decided to consolidate their Chicago store with that of the Chicago Screw Company at 2 North Canal street. These two companies have been working in harmony for some time and the concentration of the stocks carried by each in one warehouse will give each company an exceptionally large and widely assorted stock to draw from in filling orders. No change will be made for the present at the Illinois Screw Company's factory at Chicago Heights. O. L. Bicknell, formerly manager of the Illinois Screw Company, has been made manager of the combined store, and Messrs. Barry, Nelson and Holst will continue to represent their respective concerns with the trade as heretofore.

THE ATLANTA CONVENTIONS.

AS has already been noted in these columns, the annual convention of the Southern Hardware Jobbers' Association and the semiannual convention of the American Hardware Manufacturers' Association will be held at Atlanta, Ga., on May 24-27, the jobbers holding their sessions in the ballroom of the Kimball Hotel and the manufacturers at the Piedmont Hotel. The programme for the jobbers' meeting has been determined, and the topics selected for discussion should prove interesting and instructive. The convention will open on Tuesday morning, May 24, this session being an open one, at which manufacturers and other visitors will be present. At the afternoon session (executive) reports from the numerous committees will be presented. There will also be a discussion of the topic "Our Association—What Shall Be Done to Nurture It?" Wednesday morning's session will also be executive, "The Hardware Jobber—His Worst Enemy," and "Our Association—Benefits, Past, Present and Future," being discussed by the members in five-minute addresses. Wednesday afternoon will be devoted to a joint session with the American Hardware Manufacturers' Association, which will be held at the Piedmont. The formal subjects for discussion at this gathering are "Rebates and Restrictive Prices from Manufacturers of Association Goods vs. Open Market," and "Should Not Manufacturers Protect the Jobbers Against Radical Declines Brought About by Disagreements in Their Own Associations?" It is proposed to open the discussion on these two topics by a formal address from a jobber, who will be followed by one of the manufacturers present, who will reflect his views, after which there will be a general discussion through the medium of five-minute addresses. On Thursday morning the jobbers will hold an executive session, the principal feature of which will be the discussion of "Increased Expense Account and How to Reduce It" and "Employees' Mutual Benefit Association." In the afternoon another joint session with the manufacturers is on the programme, the gathering this time being in the jobbers' headquarters, the Kimball. The subjects for discussion are "Suggestions to the Buyer from the Traveling Man" and "The Injustice of Associated Manufacturers Withholding Premiums from Jobbers on Account of the Purchase of Goods Other than Their Manufacture." The convention will come to a close on Friday morning. The matter of entertainment has not been neglected, and members will find that ample preparations have been made to interest them during the evenings of the gathering.

COL. JAMES R. NUTTING.

THE March number of *Thrift*, published at Cedar Rapids, Iowa, contains an interesting biographical sketch of Col. James R. Nutting. Although he was born in Washington County, N. Y., of sturdy New England ancestry, Colonel Nutting is essentially a Westerner, going to Iowa as a boy with his father, who located on a farm near Davenport. Later in life under his management the Sickels, Preston & Nutting Company, Davenport, Iowa, became a leading Hardware establishment in that State. Colonel Nutting was the first president of the Iowa Hardware Jobbers' Association. He has also served as secretary of the Mississippi and Missouri Valley Hardware Jobbers' Association, and as vice-president of the Mississippi and Missouri Trade Association, organized at St. Louis. For years he has been an active member of the National Hardware Association, and is still chairman of the Press Committee. While he has never held political office and has no aspirations in that direction, Colonel Nutting takes an active interest in Governmental questions, having been for years president of the Railway and Commercial Men's Political Club.

FACTORY COST AND BUSINESS METHODS.

COST FINDING FROM A MANUFACTURER'S VIEWPOINT.

BY CHAS. A. GEIGER.

An interesting paper read before the National Association of Wagon Manufacturers by Chas. A. Geiger, manager of the Troy Wagon Works Company, Troy, Ohio.

PART II.—Conclusion.

ALL LABOR CHARGED ON ORDER.

All labor should be furnished with time slips and be required to record thereon the time spent on any given part needed to complete any shop order, recording time taken for each operation necessary; these time slips to be posted on to the general shop order which follows the material through the factory to the place of carrying the ideal stock, and also used for balancing with payroll. When a given order is complete the cost of every part is of record and may be posted into books for future reference and for the purpose of obtaining an average cost for same parts made at different times.

To the productive labor cost is added the nonproductive by percentage, and the total is balanced with the payroll at pay day periods. The shop order starts with specifications for material and finishes with the complete record of labor, to which labor the co-expense percentage is added, and cost finding is complete.

The labor cost of any part at any stage of completion establishes the amount of co-expense which such part should bear thus far on its way, so that inventory prices are readily and accurately secured. Cost assemblies of complete units are readily secured from records, and the total of the material, labor and co-expense in any given period obtained; and the total of these deducted from the sales account shows the profit for the period.

CO-EXPENSE SHOULD BE DIVIDED.

The co-expense items require frequent and vigorous treatment, and should be subdivided. Certain of these items arise from the operation of the factory, and are, therefore, properly called shop co-expense. Others arise largely from the business of selling the output, and are selling co-expense; and under these two heads the more detail in the way of items of subdivision the better.

SHOP CO-EXPENSE.

Shop co-expense should include fuel, light, power, shop supplies, insurance, taxes, maintenance of buildings and machinery, depreciation, such part of the interest account as does not properly belong to selling co-expense, drayage and teaming, superintendent's salary when not a part of payroll, office salaries and expenses which occur on account of shop business, and a proper proportion of the salaries of the managers of the business, say, one-half, and sundry general unclassified items, which should be reduced to the minimum by increased items under other heads.

SELLING CO-EXPENSE.

Under selling co-expense should come traveling men, their expenses and commissions; printing and advertising, postage, office salaries and expenses which occur on account of selling, also a proper proportion of the salary of the managers, say,one-half; discount for cash or otherwise, allowances for repairs under warranty, losses for bad accounts or otherwise, including collection and attorney's fees; that part of the interest account which equals interest on the average monthly accounts and bills receivable, all outside transfer and warehouse expenses, all freight and express allowed customers, including errors of shipment or otherwise, including cost of parts broken and lost in shipping, and general selling expenses, including sundry unclassified items.

DEPRECIATION.

There is one item under the co-expense which is regarded as sufficiently important to require special mention—viz., depreciation. Statistics gathered by standard authorities state that 90 per cent. of all business men fail at one time or another in their business careers. Why is this so? Is it not caused largely by the self deception almost universally practiced by the business world? In prosperous times both real and personal property is overrated as to its value as a realizable asset. Depreciation of value by reason of use, lapse of time and change of conditions is frequently lost sight of till the need is greatest and when facts are hardest to bear. Very few estates are settled up at their previously reputed worth. Very few failed businesses are settled by the statement made at the time of the failure. The temptation is strong to allow real estate, machinery, bills and accounts receivable, &c., to stand on the books at a higher than realizable value. Manufacturing property frequently sells at 20 per cent. of its former book value. It is part of the cost and sound business sense to from time to time provide against just such contingencies in the same way as a possible loss by fire. What is a proper amount for depreciation depends somewhat upon the class of business, but if the expense accounts are charged with all items for maintenance of buildings and machinery, 2 per cent. per annum in addition to the above is a reasonable average. Losses are properly part of depreciation, and should be charged upon an average of several years' experience.

INVENTORY.

In common practice the purpose of the annual inventory is the ascertaining of the net profits of the business, and actual profits or losses are not known until after inventory time, and frequently too late to correct. Manufacturing is the business, and primarily it is sought to ascertain the profits from this only. Other than manufacturing profits may accrue, but are irregular and unforeseen, and should only be considered separate from the regular business. To find the manufacturing profit the base price for the inventory should be the net average cost price of the raw materials, or the same as that at which the individual costs are figured. If, then, a correct account of the amount of raw materials going into the product is kept, the last inventory plus the purchase, less the amount of materials shipped, should balance with the inventory after taking into account the labor and co-expense on hand and shipped. It is customary with many concerns to use the market price as the inventory price of raw materials. This may be a perfectly safe way in case there are no violent changes in the market, as has been the case in the past five years. Profits or losses from advance or decline of the market price of materials on hand are unreal, because not stable or realizable until the goods to be manufactured are sold and the pay is in hand therefor. It is perfectly proper at inventory time to estimate profits by reason of the increased market price of materials on hand, but this should be kept entirely separate from manufacturing profits, so that factory profits or losses can be clearly shown.

SAFE RULES FOR CONSERVATIVE RESULTS.

The following rules will be a safe guide to conservative results, viz:

1. Specifications of all raw materials in each unit, priced at flat cost price.
2. A correct account of all stock delivered to the factory, as well as correct record of loss in working.
3. An ideal stock and no work done undess complete specifications accompany an order for same.
4. Itemizing all productive labor operations in all departments, and including a correct percentage for nonproductive labor.
5. Making labor the base for all other additions by percentage.
6. Making factory production bear all expenses of whatsoever nature, including depreciation.
7. Find what percentage co-expense is of the labor and divide into shop and selling.
8. Annual inventory at net cost price.

9. Add to cost price by percentage to make inventory show worth at market price.

10. Make monthly or weekly statement of profits, and by means of continuous cost finding keep continuous inventory.

11. Make a correct and complete assembly of the costs of each unit, so that each part or each complete unit bears its proper proportion of all expenses of the business.

LACK OF KNOWLEDGE RESULTS IN FAILURES.

If all manufacturers in a given line would use a continuous cost finding system, the gentleman's agreement for the maintenance of prices on a profitable basis will amount to something in the various associations, which is now not the case. Lack of knowledge of costs by many individuals is the prime cause of all the failures in the manufacturing business.

THE NEW YORK AND NEW JERSEY HARDWARE AND IRON ASSOCIATION.

THE fifth annual banquet of the New York and New Jersey Hardware and Iron Association was held at Hotel Vendome, New York City, on the evening of March 24. The following persons were present:

Albert Ruppert.	Chas. D. Rueve.
George Hollerieth.	Wallace Tiebout.
E. Striffler.	Joseph Ruppert.
Henry Bodevin.	Hon. F. W. Wurster.
M. Eisig.	Wm. E. Kleine.
C. Ten Eick.	Edward Darlington.
Philip Langler.	Ralph H. Tiebout.
P. Quackenbusch.	E. Van Zahn.
Emil Rudolph.	Dr. Pruden.
L. B. Morris.	E. Doremus.
Frederick Wurster.	J. Henry Ruwe.
George Ruppert.	Edward Kircher.
Sam Speck.	E. Van Winkle.

After the ample repast had been partaken of, Wm. E. Kleine, toastmaster, announced that the committee had decided that formal speeches should not form a part of the programme, but as Mr. Eisig was about retiring from business, he was sure all would be pleased to hear the parting words of this esteemed member. The gentleman's remarks took the form of a poem, the result of a dream, in which members of the association figured in unusual situations.

Hon. F. W. Wurster made a brief but interesting address, in which he particularly referred to the benefits that the association had confered upon the members in the way of pleasanter business relations, and in the spirit of fraternity which was so manifest about the table.

A parody on "The Village Blacksmith," by Longfellow, entitled "The Village Bragsmith," by "Shortfellow," was given by the toastmaster, in which were depicted unpleasant peculiarities of some of the slow paying customers of the Heavy Hardware trade.

A unique feature of the menu was two pages devoted to doggerel, to be sung to the tune of "Mr. Dooley," in which the predominating characteristics of the officers and some of the prominent members of the association were humorously portrayed. This was sung at intervals during the evening by the entire company. A professional pianist, a vocalist and a humorist furnished additional entertainment during the evening.

The association has chosen the following officers for the ensuing year: Joseph Ruppert, president; Ralph H. Tiebout, vice-president; Henry Bodevin, secretary; Emil Rudolph, treasurer.

LOGAN-GREGG HARDWARE COMPANY.

LOGAN-GREGG HARDWARE COMPANY, Pittsburgh, Pa., have just issued their spring and summer catalogue of General Hardware. This catalogue represents an exceptionally large and complete line of season goods and comprises nearly 300 pages. The increasing attention which Hardwaremen are giving to Paints is illustrated in the catalogue, in which this line is given a prominent place, sample color cards being provided, making it very easy to select from the catalogue just what is wanted in this line.

HARDWARE CLUB.

THE new Board of Governors of the Hardware Club elected at the annual meeting Saturday, March 19, met Thursday evening, March 24, and organized for the ensuing year by re-electing the executive officers as follows: R. R. Williams, president; J. Leonard Varick, vice-president; Thomas F. Keating, treasurer, and Arthur G. Sherman, secretary. Two new governors, Francis B. Griffin and Henry L. Freeland, were elected to fill the places formerly occupied by Webster R. Walkley and George T. Laighton, both of whom declined a re-election. Resolutions were adopted expressive of the high regard in which Messrs. Laighton and Walkley are held by the board, and its appreciation of the value of their services during the long period of their identification with the club. Mr. Laighton is at present absent from the city spending a few weeks in the South. After the business meeting of the board a banquet was tendered to Mr. Walkley in recognition of his long services to the club since its organization, at which interesting addresses were made by a number of those prominently identified with the organization.

RHODE ISLAND HARDWARE DEALERS' ASSOCIATION.

THE old Providence, R. I., Nail Association has been merged into the Rhode Island Hardware Dealers' Association, which has been organized to include the retail Hardware dealers of all Rhode Island. The Nail Association had been in existence about 20 years, and included in its membership retailers of Pawtucket and Central Falls, as well as Providence. No attempt was made to include other parts of Rhode Island. The new association starts with a membership of about 20 houses located in Providence, Pawtucket, Olneyville and Central Falls. It is hoped that this membership will be largely increased by additions from all over the State. The officers of the association are:

PRESIDENT, E. A. Loomis, Belcher & Loomis Hardware Company, Providence.

VICE-PRESIDENT, W. A. Bosworth, Bosworth & Aspinwall, Providence.

SECRETARY, F. T. Kelley, Barker, Chadsey & Co., Providence.

TREASURER, C. H. Angell, Union Hardware & Electrical Supply Company, Providence.

The Executive Committee consists of the above officers and Frank Duffy, Duffy Bros. & Co., Pawtucket; John McGlinchey, Olneyville, and George P. Peterson, George P. Peterson Company, Providence. The annual meeting will be held in June.

DEATH OF W. H. STANTON.

WILLIAM HILL STANTON, secretary of the Biddle Purchasing Company, New York, died very unexpectedly of pneumonia Sunday, March 27, while on a pleasure trip to Bermuda. Accompanied by Mrs. Stanton, he left New York March 19 for a run to that resort, he being in his usual health, apparently, although a little run down, as he expressed it, the intention being to return by the steamer arriving in New York Wednesday, March 30. Mrs. Stanton returns with the remains on this steamer. Definite funeral arrangements have been deferred until her arrival.

Mr. Stanton was born in New York and was in his forty-sixth year. Soon after the beginning of the Civil War his father, Oliver H. Stanton, moved to Montreal, Canada, where the son remained until the latter part of the seventies, his father being in the real estate business. Coming to New York, W. H. Stanton was employed by C. M. Biddle & Co., Philadelphia and New York, and had been with that house continuously, with the exception of two or three years in the later 80's Mr. Stanton was a man of excellent character and habits, of a companionable and genial disposition, and had a wide acquaintance and many friends in the trade. He was elected a member of the Hardware Club a year ago.

AMONG THE HARDWARE TRADE.

P. Feddersen & Co., Davenport, Iowa, have disposed of their general Hardware business to H. & H. Rohlff, who will continue at the old stand.

Mitchell & Simpson, Ida Grove, Iowa, have sold their Hardware and Stove business to William Colvin & Son.

John Kruse & Son is the style of a new firm who have recently entered the retail Hardware, Stove, Paint and Sporting Goods business at Mt. Clemens, Mich.

W. N. Maloney is successor to R. H. Reynolds & Son in the Hardware, Stove and Harness business at Red Oak, Iowa.

Larson, Benson, Nordgren Company, Joliet, Ill., have recently been incorporated with a capital stock of $10,000 to carry on the Hardware, Stove, Paint and Plumbing business.

The ownership of the Wooster Hardware Company, Wooster, Ohio, has changed hands. After 25 years' connection with the business, I. N. Kinney has retired, selling his interest to Welker G. Christy. L. S. Cooley, another member, has sold out to his son, A. F. Cooley, while John C. Shultz will continue his interest. The firm are wholesale and retail dealers in Hardware, Paints, Oils, Farm Implements, Wagons and Buggies, &c.

Clauda & Meyer, general Hardware merchants, Adrian, Mich., have been succeeded by Clauda, Meyer & Littleton, Geo. W. Littleton having been admitted as a member of the firm.

The Frank E. Rowe Company, New Milford, Conn., have been incorporated with a capital stock of $6000 to deal in Hardware, Paints, Lumber, &c.

C. V. B. Barse Company, Olean, N. Y., have been incorporated with a capital stock of $30,000. This business was established by Mr. Barse in 1848.

M. L. Miller has disposed of his Hardware, Stove and Sporting Goods business in Axtell, Neb., to Scott & Einsel.

O. P. Sontag has lately commenced business at Winona, Minn., handling Shelf and Heavy Hardware, Stoves, Tinware, Paints, Sporting Goods, &c.

G. C. Clarke, Hardware merchant, Scott, N. Y., has been succeeded by G. F. Barber & Son.

Lyon Hardware Company have recently succeeded E. P. Langesen at New London, Wis.

Wells & Wells are successors to McVean & McVean in the Hardware business at Dresden, Ont.

B. S. Motley & Co. have bought out the retail department of the business of the Piedmont Hardware Company, Danville, Va., and will continue at the old stand, the Piedmont concern having moved into their new store.

TEXAS HARDWARE JOBBERS' ASSOCIATION.

THE annual meeting of the Texas Hardware Jobbers' Association will be held at the Rice Hotel, Houston, April 21-23. Among the papers which will be read are the following: "Taxation on Goods Carried in Storage," by F. A. Heitmann; "How Can Manufacturers Assist in Maintaining Prices?" by W. L. Sanford; "Should Not Staple Goods be Sold on 30 Days' Time?" by H. W. Cortes; "System and Its Advantages to the Hardware Business," by Chas. Nash. There will also be a Question Box.

AUSTRALIAN NOTES.

FROM A SPECIAL CORRESPONDENT.

Canada and the Antipodes.

Canada is hustling for a share in Australasian trade, and attempting reciprocal advantages. Her agents out here are well posted and business like. And right here comes the question, Would it not pay American exporters to have a central bureau or warehouse in such cities as Melbourne and Sydney? The expense, divided among a large number, would be a mere bagatelle. Such bureau need only exist for purposes of giving and receiving information, not for booking orders. But prices and particulars, catalogues, freight estimates, &c., might be compiled and kept up to date. Is the idea not feasible? Brains would need to be at the back of it, to prevent such mistakes as the New South Wales Commissioner to the East recently perpetrated. That gentleman recently cabled to his Government from Japan an order for 250 tons of lead at £10 18s., and the morning papers here inserted the item under a "scare head," although the mineral at the time was in demand at approximately £11 5s. a ton.

Sewage Pipes.

A fierce controversy has been raging in the press over the adoption of cement pipes for sewerage purposes in preference to vitrified stoneware. Makers of the latter class have had the game in their own hands for several years past, and the prices for the large contracts which have been let in connection with the Melbourne sewerage scheme have steadily gone up from 8½ pence to 1 shilling 5 pence for 4-inch pipe. The lowest tender for the last contract was £58,000, and a local cement firm, the Australian Portland Cement Company of Geelong stepped in with a tender of cement pipes at £47,000. It appears that cement pipes for sewerage purposes are used with satisfaction in some of the cities of the Old World, and if successful here the saving to the taxpayers will be substantial, and will effectually break the pipe makers' (stoneware) combine.

Victorian Hardware Association.

The Victorian Hardware Association held its annual general meeting January 26. Henry Meeks of Morris & Meeks was re-elected president for the coming year and Mr. Gallatly (Melbourne manager of Briscoe & Co.) was elected vice-president. The committee for the year are Albert Duckett of Ed. Duckett & Sons; Chas. Green of C. S. Green & Co.; Alex. Mair of A. Mair & Sons; J. S. Henderson of Jas. McEwan & Co., and L. Buchholz, of S. Cohen & Sons, all of Melbourne. The London Committee are: Francis Chapman, Fenchurch street, London, D. L. Tait of Briscoe & Co., London, and J. Malcolm, of Jas. McEwan & Co., London.

TRADE ITEMS.

THE NATIONAL WIRE CORPORATION announce the removal of their Chicago offices from the Rookery Building to 56-58 West Van Buren street.

THE copartnership of E. C. Brown & Co., Rochester, N. Y., has been succeeded by the corporation of the E. C. Brown Company, the management continuing unchanged. The firm were established four years ago, and manufacture a complete line of Spray Apparatus.

ARMSTRONG, WALLS & Co., 45 Centre street, New York, will on or about May 1 remove their stock and business to 82-84 Centre street, where they have leased the entire store and basement, each 40 x 70 feet. This proceeding was necessary in order to enlarge their facilities for carrying stock and bettering their shipping facilities. The concern carry lines of machine shop, mill and factory supplies.

Taylor Hardware Company, Austin, Tex., have discontinued business, and a new firm has been organized under the style of Webb, Taylor & Perry, comprising J. W. Webb of the firm of John A. Webb & Bro., and H. H. Taylor and James B. Perry, of the former Taylor Hardware Company. They will conduct a wholesale business in Hardware, Tinware and Woodenware.

National Retail Hardware Dealers' Association.

CONCLUDING REPORT.

AS stated in our last issue, the fifth annual convention of the National Retail Hardware Dealers' Association, composed of delegates from State associations, met in Indianapolis, Ind., March 22, 23 and 24. The proceedings of Tuesday, 22, with banquet, were reported in last week's issue. The following pages give the leading features of Wednesday's and Thursday's sessions.

Secretaries' Session.

At 9 a.m. Wednesday the secretaries of the various State associations met in special session to consider matters relating to their particular duties and to give each other the benefit of their various experiences. M.

W. P. BOGARDUS, President.

L. Corey, national secretary, was chairman, and C. M. Barnes, secretary of the North Dakota Association, was secretary, of the meeting. Mr. Corey reviewed the work of the secretaries of the State associations, and complimented them highly for the large part they had played in the success and development of the State associations. He told of the formation of new associations in States heretofore unorganized, and stated that the association work was progressing admirably.

Comparison of Prices.

It was decided that it was desirable to secure reliable information as to prices that dealers were paying for standard lines and also as to their retail selling prices, and it was decided that it would be desirable to have four dealers, members of the association, in each county appointed, to whom secretaries of State associations would look for information concerning prices.

How to Secure New Members

was a question that called for extended discussion, and it was the sense of the meeting that personal solicitation was much more effective and but little more expensive in the long run than correspondence.

Treasurer's Report.

The regular session was resumed at 11 a.m. A. T. Stebbins, the national treasurer, made his annual report, giving in detail the receipts and expenditures during the year. This report, which showed a balance of over $500 in the treasury, was referred to the Auditing Committee. Mr. Stebbins urged that steps be taken to augment the income of the National Association because important work had been neglected during the year owing to lack of funds to prosecute it. How to increase the revenue led to a general discussion.

Invitation from E. C. Atkins & Co.

An invitation was read from E. C. Atkins & Co. to visit their works in the city. On motion the invitation was accepted with thanks, and the association decided to set 8 o'clock the next morning as the time to make the visit.

Transportation Committee.

In order to secure reduced fares to annual conventions it was decided that a permanent committee of three members be appointed by the Chair, to whom all matters of transportation should be referred. This committee consists of Dennis McLaughlin and F. F. Porter of Chicago and M. L. Corey of Argos, Ind.

Parcels Post.

The best method of checkmating parcels post legislation now before Congress, or that would hereafter be presented, was discussed and the matter was referred to the Committee on Resolutions.

WEDNESDAY AFTERNOON SESSION.

An address by Vice-President C. H. Miller on "National Insurance" opened the work of the afternoon. Mr. Miller said, among other things:

Mr. Miller on Co-operative Insurance.

This matter of co-operative insurance is strictly a business proposition. When I am offered Hardware at 25 or 50 per cent. below what I have been paying, and I am satisfied as to the quality, I buy at the lower figure, don't you? The past experience of well conducted mutuals warrants the claim that such a saving will result, and for the following reasons:

WHERE THE SAVING COMES IN.

1. On account of the risks being scattered, it is scarcely possible and highly improbable that more than any one risk is subject to the same fire. It is impossible for our company to suffer such a calamity as befell many companies at the great fires of recent years, such as Paterson, N. J., Waterbury, Conn., and, more recently, the

W. H. TOMLINSON, First Vice-President.

city of Baltimore. It is only stock companies and mutuals conducted on an entirely different plan that suffer in such great conflagrations.

2. Class risks. Statistics show that Hardware risks are not so hazardous as the underwriters are wont to try to make us believe them, and for that reason we are suffering an unjust tax from stock companies.

3. Selected risks. That the members of the National Association comprise the better and more enterprising

element of the Hardware dealers is evident, and since the insurance in this company is limited to association members, we at once confine our operations to the most desirable class of Hardware risks, and, further than that, every risk is subjected to the most rigid inspection by the Executive Committee, and I regret to say they have found it necessary to pass unfavorably on some applications.

FIRE PREVENTIVES TO BE ADOPTED.

With these three advantages—scattered risks, class insurance and selected risks—we have an advantage in fire protection which is impossible in stock companies as conducted to-day, whose plan is at best a betting that

F. C. MOYS, Second Vice-President.

bad risks will not burn. I might also add that it is the intention of the speaker to take such steps as may enable us to employ certain simple fire preventives that may decrease the present hazard.

TRIBUTE TO LOYAL CO-WORKERS.

My remarks to-day would be incomplete indeed if I did not direct attention to the service rendered the national company by certain members. I beg to suggest the propriety of this meeting passing a resolution of thanks to be tendered to the seven Hardware merchants in Pennsylvania who formed a temporary organization of the insurance company and constituted their Board of Directors and officers, who held office until January of this year. In this connection I desire also to call attention to the signal service of one who has labored untiringly from the first, whose counsel was often sought and who was always ready to respond. I refer to W. P. Lewis of New Albany, Ind.

Mr. Miller's report was adopted and he was tendered a vote of thanks, on motion of Mr. Hall of Nebraska.

THURSDAY'S SESSIONS.

The majority of the delegates made a tour of the works of E. C. Atkins & Co., manufacturers of Saws, Indianapolis, by invitation of that company, and this fact delayed the convening of the morning session until 11 a. m.

Adverse Business Legislation.

The subject of adverse business legislation was considered, W. P. Lewis leading in the discussion.

The Auditing Committee reported that they found the books of the treasurer correct, and their report was adopted and the committee discharged.

Advertising and State Association Programmes.

Each State association publishes a programme more or less elaborate just prior to the meeting of the State association, and it has been the custom of some secretaries to solicit advertising for these programmes, the expense of printing the programmes being defrayed in this way, and in some States the treasury funds are considerably augmented by revenue from this source. The National Association also issues a manual, and a motion was adopted instructing secretaries to leave the general field of advertising as much as possible to the national manual, confining their solicitations for advertisements in State programmes to jobbers in their own States, jobbers doing business in many States, and manufacturers in their own States.

Next Annual Convention at Minneapolis.

The first order of business for the afternoon session was the selection for the next place of meeting. Mr. Moys of Colorado presented the claims of the city of Denver; Mr. Digby of McKee's Rocks, Pa., placed Pittsburgh in nomination; an invitation to select Detroit, written by the secretary of the Detroit Board of Commerce, was read by the secretary; C. A. Peck of Berlin, Wis., spoke in behalf of Milwaukee. A number of Minnesota delegates presented the claims of Minneapolis in such an eloquent manner, however, that that city was selected as the next place of meeting.

Resolutions.

The following resolutions were submitted by the committee and adopted:

Resolved, That it is the sense of the National Retail Hardware Dealers' Association that the thanks of this association be extended to our worthy president, W. P. Bogardus, and our efficient secretary, M. L. Corey, and to the individual members of the Executive Committee for their arduous labors performed during the year now ending; and especially to our president and secretary for the work done at Atlantic City in combating the insidious efforts of the Parcels Post League in their endeavor to make use of the United States mails in carrying out their designs, which could not but result in loss to the Government and in disorganizing the mail service for the benefit of the few.

Resolved, That we extend to the public press of Indianapolis a vote of thanks for the many courtesies extended during this convention, and especially commend the stand taken by the Indianapolis *News* in its fidelity

M. L. COREY, Secretary-Treasurer.

to the interests of good government and in keeping the public informed and condemning the abuses that have crept into the Rural Free Delivery service, and in insisting that in the performance of their duties the carriers keep strictly within the rules of the postal service.

Resolved, That we extend to the trade papers a vote of thanks for the many courtesies extended by them, not only to us in national convention assembled, but also to the several State associations, and that we recognize particularly the valuable assistance rendered by *The Iron Age*, the *Hardware Dealers' Magazine*, the *American Artisan* and *Stoves and Hardware Reporter* in furthering the interests of national and State Hardware work.

Resolved, That a vote of thanks be extended to those

manufacturers and jobbers who are earnestly striving to have their several products and stocks of merchandise marketed through legitimate trade channels—viz., the retail Hardware dealer.

Resolved, That a rising vote of thanks be extended to the patrons, and the committee of the Indiana Association, through their chairman, F. D. Stalnaker, in arranging and extending the delightful hospitality to the members of this association Tuesday evening, March 22, at the magnificent home of the Columbia Club, and that the secretary be instructed to transmit to the Board of Governors of the club, to the patrons and to Mr. Stalnaker, the chairman, a copy of this resolution.

Resolved, That a vote of thanks be extended to E.

T. FRANK IRELAND, Executive Committee.

C. Atkins & Co. for the courtesies shown us in giving the members of the association an opportunity to visit and inspect their plant, which is one of the great industrial works of this city, and we also commend the stand taken by that company in marketing their products through legitimate trade channels—viz., the retail Hardware dealer.

Resolved, That a vote of thanks be extended the following named members of the Pennsylvania Hardware Association; Jos. M. Selheimer, Jas. L. Kline, S. S. Bryan, Geo. V. Thompson, Harry Swank, C. H. Miller, Geo. W. Hackett, A. H. Kauffman, and others who rendered such valuable assistance to the Executive Committee in the organization of the National Insurance Association, and the secretary be instructed to transmit a copy of this resolution to each of the above named gentlemen.

NATIONAL HARDWARE INSURANCE ASSOCIATION.

Resolved, That a vote of thanks is due and is hereby tendered to the officers and Executive Committee of the National Hardware Insurance Association for their untiring and successful efforts in launching the National Hardware Insurance Company, and we especially recommend this company to all association members as affording safe and reliable insurance.

We hereby suggest and recommend that some action be taken by the officers and Executive Committee whereby the National Hardware Insurance Association may contribute a just and equitable amount to the support of the National Retail Hardware Dealers' Association, and that in accepting business they keep strictly within the bounds of the constitution, and under no circumstances accept business from nonassociation members.

FOR BETTER PACKAGES.

Resolved, That we are in favor of better boxes and packages for Shelf Hardware, and we suggest and recommend that the matter be referred to the Executive Committee of the National Association as a proper subject for conference with the manufacturers and jobbers.

AGAINST PARCELS POST LEGISLATION.

Whereas, It has come to our knowledge that a bill has been introduced into Congress providing for the carrying of merchandise through the United States mails at less than actual cost to the Government; therefore, be it

Resolved, That we, the National Retail Hardware Dealers' Association, in convention assembled, representing the distributers of the products of the largest industrial and manufacturing interests of the United States, most earnestly protest against the passage of this or any other measure that will encroach upon the interests of private domain by furthering the interest of the few at the expense of the many.

Resolved, That the article in Associated Press reports covering the action of Congressman Crumpacker of Indiana be referred to Secretary Corey with power to act.

PRIVACY OF "BULLETINS."

Resolved, That in order to maintain the National Hardware *Bulletin*, we recommend that the national secretary provide a suitable binder, which will be furnished at a nominal cost to each subscriber, thereby enabling the president, secretary and the Executive Committee to maintain a more rigid censorship of State and national committee work.

TO PREVENT MANUFACTURERS SELLING DIRECT TO CONSUMERS.

Whereas, As it has been called to the attention of this association that the manufacturers of Screws, Bolts, Tacks, Set and Cap Screws, Nuts, Washers, Rivets and kindred lines, are selling their products to the consumer at as low prices as can be obtained by the legitimate Hardware dealer; therefore, be it

Resolved, That it is the sense of this association, in convention assembled, that this practice works a very great injustice to the members of this association, and we would suggest that this question be referred to the officers and Executive Committee as a proper subject for conference with the manufacturers and jobbers.

Elkins Bill on Shipping Ammunition.

The Legislative Committee made the folloing report:

Whereas, It has come to our attention that there was introduced in the Senate of the United States by Senator Elkins a bill known as Senate File 4319, which bill seeks to inspect and control the shipping of ammunition, giant powder and other explosives, and

Whereas, We know of no accident having occurred by reason of the shipping of the ammunition therein referred to, especially metallic cartridges, loaded shells and percussion caps; therefore, be it

Resolved, That we, the members of the National Retail Hardware Association, in convention assembled, do protest against the enactment of this portion of the bill, believing that it would unnecessarily increase the cost to the consumer. We further recommend that copies of this resolution be forwarded by the secretaries of the State associations to the respective Senators and Representatives in Congress.

IN MEMORY OF MR. BOCK.

Whereas, Death is the path that must be trod if man would ever pass to God. Our well loved associate has

JAMES L. KLINE, Executive Committee.

passed into the dark and silent land before us, but the memory of his virtues abides with us and reflects its luster beyond the portals of the tomb. Charles F. Bock of Battle Creek, Mich., was one beloved by all who knew him—a public spirited man, a kind husband, a loving father and a good citizen. He held positions of honor and trust in his native city and served this association with full fidelity. Be it

Resolved, That we deplore his loss and extend our deepest sympathy to his bereaved loved ones, and that

a copy of these resolutions be suitably engrossed and presented to the family of the deceased.

The report of the committee was accepted and the resolutions adopted by a rising vote.

Election of Officers.

The Committee on Nominations recommended the following members as officers for the ensuing year, the

FRANK F. PORTER, Executive Committee.

office of second vice-president having been newly created:

PRESIDENT, W. P. Bogardus, Mt. Vernon, Ohio.

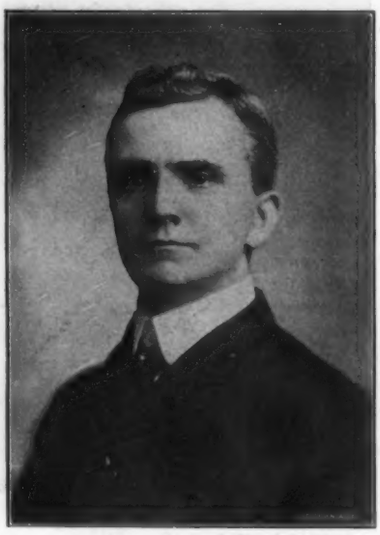
FIRST VICE-PRESIDENT, W. H. Tomlinson, Le Sueur, Minn.

SECOND VICE-PRESIDENT, F. C. Moys, Boulder, Col.

EXECUTIVE COMMITTEE: T. Frank Ireland, Belding, Mich.; James L. Kline, Williamsport, Pa.; Frank F. Porter, Chicago, Ill.; S. E. Jones, Richmond, Ind.; A. H. Abbe, New Britain, Conn.

The report of the committee was adopted and the secretary was instructed to cast the vote of the association for the nominees.

Short addresses were made by the newly elected of-



SHARON E. JONES, Executive Committee.

ficers, in which they thanked the association for the honor conferred upon them.

SECRETARY COREY RE-ELECTED.

At a meeting of the Executive Committee held in the evening M. L. Corey was re-elected secretary of the National Association.

Parting Advice.

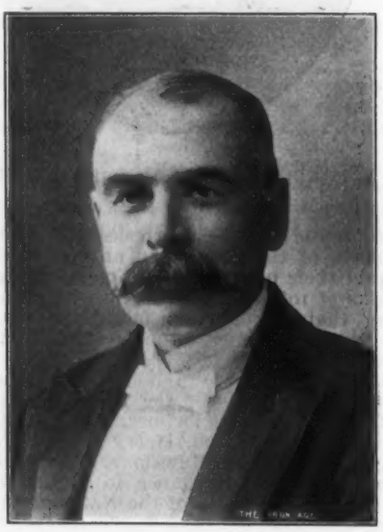
Before the convention adjourned finally Secretary Corey addressed the delegates and urged each one to act as a sentinel during the coming year, reporting to the secretary of his State association anything that comes to his notice that seems to affect favorably or unfavorably the interests of the association and its members. He stated that it was impossible for any secretary, no matter how talented or brilliant, to keep in touch with all the ramifications of business, but that with each member of the association a standing committee of one to assist the secretary, the success of the National Association and the State associations would be increased immeasurably. He asked members to write their secretaries frequently and keep in touch with them.

The association then adjourned *sine die*, the date of next meeting to be decided and announced later.

DELEGATES PRESENT.

Roll call of delegates showed the following in attendance:

ARKANSAS: C. E. Taylor, Little Rock.
COLORADO: F. C. Moys, Boulder.
CONNECTICUT: A. H. Abbe, New Britain.
ILLINOIS: Dennis McLaughlin, Chicago; F. F. Porter, Chicago; L. D. Nish, Elgin; Geo. Meyer, Peoria.
INDIANA: A. N. Shidler, South Bend; J. L. Fulton, Portland; Adam Stratman, Huntingburg; Chas. Hall, Indianapolis; Sharon E. Jones, Richmond; E. M. Bush, Evansville; M. L. Corey, Argos; W. P. Lewis, New Albany.



A. H. ABBE, Executive Committee.

INDIAN TERRITORY: S. R. Frazee, Vinita.
IOWA: S. R. Miles, Mason City; L. Lindenberg, Dubuque; H. S. Vincent, Fort Dodge; Chas. Swaine, Council Bluffs; A. R. Sale, Mason City.
KENTUCKY: John R. Sower, Frankfort; U. S. Shacklett, Fulton.
MICHIGAN: A. J. Scott, Marine City; Frank M. Brockett, Battle Creek; T. Frank Ireland, Belding.
MINNESOTA: W. H. Tomlinson, Le Sueur; C. F. Ladner, St. Cloud; A. T. Stebbins, Rochester; C. D. Decker, Austin; D. H. Evans, Tracy; W. T. Cowing, Alexandria; M. S. Mathews, Minneapolis; Julius Schmidt, Wabasha.
MISSOURI: F. Neudorff, St. Joseph.
NEBRASKA: H. J. Hall, Lincoln.
NEW YORK: H. J. Knapp, North Tonawanda.
NORTH DAKOTA: C. N. Barnes, Grand Forks; H. F. Strehlow, Casselton.
OHIO: Geo. N. Meyer, Cincinnati; C. A. Hutsinpillar, Ironton; Frank Briggs, Delta; Frank A. Bare, Mansfield; W. P. Bogardus, Mt. Vernon.
PENNSYLVANIA: James L. Kline, Williamsport; J. E. Digby, McKee's Rocks; C. H. Miller, Huntington.
WISCONSIN: C. A. Peck, Berlin; H. L. McNamara, Janesville.

HENRY MUNTZ AND FREDERICK JUNG, Elgin, Ill., have purchased the business of the Estate of F. P. Shepherd, manufacturing Patent Milk Cans, Pails, &c., and will conduct the same under the style of the Elgin Dairy Supply & Hardware Company of Elgin.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS *for catalogues, price-lists, quotations, &c., have been received from the following houses:*

FROM WINSLOW & MCCONKEY, Farmer City, Iowa, who have succeeded Henry P. Averitt in the Hardware, Stove and Agricultural Implement business.

FROM THE GEORGETOWN HARDWARE COMPANY, Georgetown, Col., who have been incorporated with a capital stock of $5000, to carry on the retail business in Shelf and Heavy Hardware, Stoves, Paints, &c.

FROM DYERSBURG HARDWARE & FURNITURE COMPANY, succeeding Dyersburg Hardware Company, Dyersburg, Tenn., who desire catalogues and price-lists, especially relating to Plumbing and Tin Shop Supplies. The company have recently increased their capital stock from $5000 to $15,000. They do a wholesale and retail business in Shelf and Heavy Hardware, Tinware, Queensware, Stoves, Buggies and Wagons, &c.

FROM TWEDT & BRITSON, Roland, Iowa, who are successors to Grove Bros., in the Hardware, Stove and Tinware business.

FROM COOPER & MIDDLETON, Clarksville, Mo., successors to B. Vandevelde in the General Hardware and Farm Implement business.

FROM MOONEY BROS., Gifford, Ill., who have succeeded Reichman Bros. in Hardware, Stoves, Sporting Goods, &c.

FROM GOLDING BROS., Hatfield, Mo., who have succeeded M. Snedecker, Hardware, Paints, Agricultural Implements, Wagons and Buggies, &c.

FROM SNYDER & SON, Linden, Ind., who are successors to D. A. Alexander in the General Hardware business.

FROM A. A. DOERR, Larned, Kan., who has bought out the wholesale and retail Hardware, Stove, Farming Implement, Paint, Sporting Goods and Vehicle business of D. G. Donavan.

FROM N. H. BLOM, Marion, Iowa, who has succeeded I. E. Gould in the Hardware, Stove and Sporting Goods business.

FROM THE BOSWORTH HARDWARE COMPANY, 1271 and 1273 Euclid avenue, Cleveland, Ohio, who have succeeded the corporation formerly known as the Barrows-Bosworth Hardware Company. The change is one in name only, the management continuing as heretofore. The company handle Hardware, Stoves, House Furnishing Goods, &c.; also have a plumbing, tinning and furnace department.

FROM T. W. EUSTICE COMPANY, Auburn, Neb., who are successors to Thompson & Perry in Hardware, Stoves, Sporting Goods, &c.

FROM JAS. J. WELCH & Co., Salem, Mass., who have lately opened up in the Shelf Hardware and Paint and Oil business.

FROM THOS. J. MITCHELL & Co., Sulphur Springs, Col., who have just embarked in business, handling Shelf and Heavy Hardware, Stoves, Agricultural Implements, Paints, Sporting Goods, &c.

FROM C. S. KNIGHT, Monroe, N. Y., who is about to embark in the Hardware, Stove, Tinware, Paint and Wooden Ware business, in connection with his former plumbing and pipe fitting work.

FROM J. R. SHEPHERD, Winston-Salem, N. C., who on April 1 will open up a strictly wholesale business in Hardware, Tinware, Glassware and Crockery. Mr. Shepherd was formerly a member of the firm of Shepherd & Norfleet, which has been dissolved.

FROM SCOTT & CROSSLEY HARDWARE COMPANY, Petaluma, Cal., who have been organized with a capital of $75,000 to carry on the retail business in Shelf and Heavy Hardware, Stoves, Farming Implements, Sporting Goods, &c.

FROM SHOFFNER & DANNAHER, Birmingham, Ala., who have recently embarked in the Hardware, Sporting and House Furnishing Goods business, wholesale and retail, mostly the latter. Both members formerly resided in Nashville, Tenn., and have each had about 15 years' experience.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers issuing new catalogues or price-lists are requested to send to THE IRON AGE *two copies—one for the Catalogue Department in the New York Office and one for the Iron Age Library of Trade Literature in London.*

THE WIRE GOODS COMPANY, Worcester, Mass.: Circular illustrating and describing the North Automatic Blind Awning Fixtures. These are suitable for old or new blinds, outside of or flush with casings, single or double blinds, used on wood, brick or stone houses.

THE HESS-SNYDER COMPANY, Massillon, Ohio: Illustrated circulars devoted to Snyder's Side Wall Registers and Novelty Spraying Pumps for use in buckets and barrels.

CHESWICK MFG. COMPANY, Cheswick, Pa.: Illustrated circular relating to Trip Gongs, the shells of which are heavily nickeled. The frame is made of iron, the gong from steel, and the hammer and lever of brass. The Gongs are referred to as not being affected by the weather, practically indestructible, neat in appearance, and as being suitable anywhere a signal gong is needed.

ARCHER IRON WORKS, Thirty-fourth place and Western avenue, Chicago: Catalogue covering their Steel Wheelbarrows, Lumber Carts, Trucks and Wheels of all kinds, and Steel Ore and Coal Cars.

IDEAL MFG. COMPANY, New Haven, Conn.: Pamphlet entitled "Instructions on How to Load and Reload Shells for the 30-40 Krag and Other High Power Rifles," which includes the .30-.30, .30-.40 and 303 British.

ALLITH MFG. COMPANY, Chicago: Catalogue of Door Hangers, Store Ladders and Merchandise Carriers. The company state that they have increased their line of Store Ladders, making it especially complete. Their Merchandise Carrying system has also been enlarged, so that they now have carriers and track to meet all conditions and for any weights. The new factory which they have recently occupied also gives them materially increased facilities both for manufacturing and shipping.

JOHN S. LENG'S SON & Co., now at 93 Reade street, New York, with warehouse at 4 Fletcher street: 64-page illustrated catalogue of all kinds of Bicycle Materials, Sundries and Tools, together with additional lines of Automobile Parts and Accessories. They are also agents for the Weldless Steel Tube Company, Birmingham, England, Cold Drawn Steel Tubes, and sole agents for a number of special brands of Bicycles and Tires.

PUTNAM & Co., 244 Water street, New York: Large postal circular calling attention to Rolling Ladders, Store Trucks and Platform Wagons.

THE WELLS LIGHT MFG. COMPANY, 44 and 46 Washington street, New York: Catalogue of the Wells Light, a portable light from kerosene oil, 800 to 5000 candlepower.

S. M. AIKMAN & Co., 261 Pearl street, New York: Printed matter illustrating and giving list prices on their line of Marine Lamps, Signals, &c.

THE FRED MACEY COMPANY, Grand Rapids, Mich.: Catalogue illustrative and descriptive of the Macey Sectional Book Cases.

GENERAL GAS APPLIANCE COMPANY, 256 West Twenty-third street, New York: Catalogue illustrates Incandescent Gas Burners, Lights, Cap Mantles, Shades, Globes, Mica Supplies, Holophone Globes, De Levy Gas Burners, Cluster Arc Lights and Reflectors, Portable Stands, &c.

SOME of the members who attended the Illinois State Hardware Dealers' convention at East St. Louis, February 23 and 24, have just sent to H. W. Quernheim of St. Louis a handsome sterling silver loving cup in appreciation of the hospitality extended by Mr. Quernheim during the convention. The cup is engraved in two panels, in one of which appear the following names: W. H. Bennett, H. H. Roberts, W. S. Cutler, D. McLaughlin, J. L. Smith, J. J. Sinzich, Evans Nelson, E. C. Loomis, A. J. Winteringham and Wm. T. Gormley.

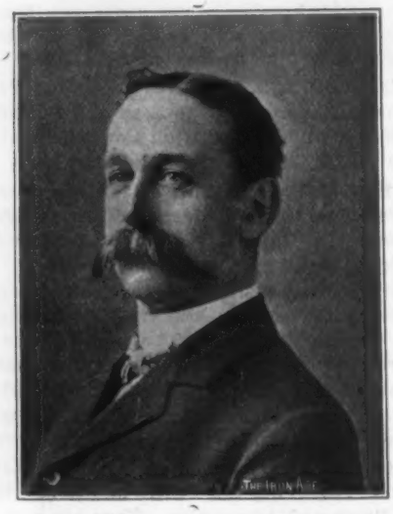
California State Retail Hardware Association.

THE third annual convention of the California State Retail Hardware Association was held at the California Hotel, San Francisco, on Wednesday and Thursday, March 2 and 3. The convention was called to order on Wednesday morning at 10 o'clock by President Roy Hall of the Kieldsen-Hall Implement Company of Fresno, Johnson Grover of Colusa was appointed sergeant-at-arms.

Members Present.

The following members answered to roll call:

William F. Lutz, Wm. F. Lutz Company, Santa Ana.
James W. Hellman, Los Angeles.
H. C. Bennett, Bennett Bros., San Francisco.
J. W. Barneberg, C. H. Reed & Co., San Luis Obispo.
C. M. Brown, Brown & Chappell, Hollister.
A. C. Burbank, J. P. Burbank, Anderson.
Chas. W. Barrett, Barrett, Hicks & Co., Fresno.
G. A. Gutman, Hochheimer & Co., Orland.
J. C. Mailer, Santa Rosa.
J. L. Cassidy, Brady & Cassidy, Grass Valley.
C. E. Kocher, Merced.
Elam Biggs, Elam Biggs Hardware Company, Grass Valley
F. W. Fisher, Fisher, Glassford Hardware Company, Fresno.



O. F. SITES, President.

E. F. Reichman, Fort Jones.
W. H. Young, Napa.
W. F. Ingalls, Napa.
J. C. White, White, Cooley & Cutts, Marysville.
Godfrey Rueger, Benicia.
A. De W. Brown, Santa Rosa.
G. J. Trott, Bryant & Trott, Santa Maria.
D. Schwarz, H. Schwarz Company, Napa.
George H. Smith, Pierce Hardware Company, Oakland.
R. W. Johnson, Johnson Company, San Rafael.
George C. Comstock, Comstock & Brin, Williams.
R. O. Kimbrough, Sacramento.
James O. Gates, Hampton Hardware Company, Marysville.
O. F. Sites, Palace Hardware Company, San Francisco.
John Simpson, Tehama.
Eastman Bros., San Francisco.
F. W. Wright, Wright Hardware Company, San Francisco.
A. P. Brunner, F. Brunner & Son, Ukiah.
Frank M. Cameron, L. W. Foster Merc. Company, Hanford.
J. U. Bearup, Madera.
Frank K. Mott, Frank K. Mott Company, Oakland.
George C. Garrett, Lyon & Garrett, Red Bluff.
F. L. Bick, T. A. Work & Co., Pacific Grove.
O. R. Cross, O. R. Cross & Son, Visalia.
F. H. Ellis, Palace Hardware Company, San Francisco.
L. O. Johnson, Arbuckle.
A. E. Finnell, Finnell & Hardin, Sebastopol.
C. L. Bills, Oroville.
Ophir Hardware Company, Oroville.
G. A. Chappell, Brown & Chappell, Gilroy.
P. J. Friermuth, Watsonville.
J. A. Murray, Woodland.
W. R. Potter, Santa Rosa.
Chris Sieber, Chris Sieber Company, Woodland.
Joseph J. Lawless, Joost Bros., San Francisco.
R. E. L. Good, Clovis.
A. W. Hawkins, Hawkins & Munger, Arroyo Grande.
C. E. Haven, Haven Hardware Company, Santa Rosa.
George M. Hickman, San Francisco.
F. J. Reid, H. H. Buhne Company, Eureka.
C. H. Williams, Kausen & Williams Hardware Company, Ferndale.
N. M. Crossley, Scott & Crossley Hardware Company, Petaluma.
R. Barcroft, Merced.
John Haenny, Lincoln.
H. E. Wilder, Vallejo.
R. M. Beebe, Gridley.
L. E. Ladd, Granger Union, Hollister.
Edward Brendlin, Pfister, Ladd & Co., Paso Robles.
Fred. T. Knoles, San Francisco.
B. C. Brown, Chas. Brown & Son, San Francisco.
Peter A. Smith, San Francisco.
John P. Maxwell, Oakland.
H. E. Robinson, Robinson Hardware Company, Gilroy.
Grant Towle, Frank Pierce, Monterey.
J. H. Barker, Ukiah.
J. E. Janssen, Eureka.
A. H. Bar, Denny, Bar Company, Etna.
J. P. Gury, Gury & Moore, Lompoc.
George A. Legg, Legg & Shaw Company, Nevada City.
Henry Gracey, San Francisco.
Max M. Brown, San Francisco.
W. C. Byrne, Byrne Bros., Santa Cruz.
A. L. Nichols, Nichols Hardware Company, Chico.
J. H. Gunn, Gunn & Ferguson, Healdsburg.
J. H. Steves, St. Helena.
E. Jones, Alexander-Yost Company, San Francisco.
C. A. Bennett, Bennett Bros., San Francisco.
James L. Emigh, Suisun.
J. Lenahan, Suisun Implement Company, Suisun.
C. H. Philpott, Philpott & Plummer, San Francisco.
J. R. West, Marion, Ind.
G. W. Tibbetts, Tibbetts & Wilson, Colusa.
Roy Hall, Kieldsen-Hall Implement Company, Fresno.
R. B. Cranston, Woodland.
M. C. Clark, A. Widemann Company, Gonzales.
Ed. Miller, Miller Bros. & Co., Sacramento.
W. W. Henderson, Henderson Bros., Lodi.
William Pierce, Suisun Implement Company, Suisun.
J. D. Turner, Turner Hardware Company, Modesto.
Chas. R. Melander, Ford & Sanborn Company, Salinas.
S. J. Dean, San Francisco.
J. A. Baxter, J. A. Baxter Company, Watsonville.
F. Rittigstein, A. Rittigstein & Co., Oakland.
G. A. Johnson, McCormick, Saeltzer Company, Redding.
W. J. Kittrell, Fresno Agricultural Works, Fresno.
Sanford Plummer, Philpott & Plummer, San Francisco.
L. J. Klemmer, Estate of J. P. Klemmer, Willows.
D. Gibson, Alexander Gibson, San Francisco.
Theo. Turner, Turner Hardware Company, Modesto.
O. C. Williams, Cloverdale.
Arthur E. Scott, Scott & Co., San Rafael.

The reading of the minutes of the second annual convention was, on motion, dispensed with, same having been printed and distributed through the mails by the secretary to each member.

The president presented the names of the North Coast and Humboldt associations for affiliation with the State association, and by a resolution, unanimously adopted, these associations were admitted into full membership with the State body.

The president then appointed an auditing committee consisting of G. A. Gutman of the Pacific Retail Hardware Association and F. W. Fisher of San Joaquin Valley Association to audit the accounts of the secretary and treasurer.

Adjournment was taken until 2 p.m.

WEDNESDAY AFTERNOON SESSION.

Following was the annual address of the president of the association:

President Hall's Address.

Over a year has sped quickly away since last we met in this same hall in annual convention, and in that brief period I feel that a few more pages have been added to the history of this association. Much has been done, and there still remains much to be done. I will not dwell upon our growth in numbers or our financial affairs, for our efficient secretary, Mr. Gracey, can and will more fully inform you as to these conditions. Your Executive Commitee have prepared an exhaustive report regarding the year's work, together with recommendations to be taken up in your deliberations. I would prefer for the present to pass these recommendations and ask your in-

dulgence upon the floor when you take them up separately for discussion and action.

I fully realize that there is a large field in this State for more thorough investigation, but your Executive Committee have been unable to take this work up in the manner desired, owing to having been hampered by lack of funds. I earnestly hope that in your deliberations you will evolve some solution of this dilemma.

When you elected me to this high station, and I assumed the duties of this office, I hoped that peace and

G. A. GUTMAN, Vice-President.

harmony would reign in the household of the Hardware fraternity, composed as it is of wholesalers and retailers, and that my term of office would be an uneventful one. Such, however, I regret to state, has not been the case.

CONTINUAL STRIFE AND DISCORD HAVE PERVADED THE RANKS OF THE WHOLESALERS,

and frequently at their instance and suggestion I have been obliged to call special committees and our Executive Committee together to try and again create harmony among them.

In all instances save one our efforts proved successful. The one in which we have met disappointment, and upon which we have expended considerable of our funds, time and energy, is the one which at present confronts us. I refer to the withdrawal of one of the prominent wholesalers from the San Francisco Iron and Metal Association—or, Iron and Pipe Agreement—and more particularly to our effort to bring about an amicable adjustment of these conditions which would be agreeable and satisfactory alike to the jobbers as a whole and to the retailers.

It affords me considerable pleasure to inform you that in the conditions which recently existed it was fully demonstrated that the members of this association have been brought to realize that the only true and sure road to success in any of their aims or desires is by united action, and, if necessary, for the moment to lose sight of personal interests and self aggrandizement, and stand shoulder to shoulder for the general welfare and betterment of all.

As my term of office is drawing rapidly to a close, I desire to take this opportunity to thank the members of this association for having honored me with this office. I desire to thank the secretary, Mr. Gracey, for whom I have but words of gratefulness and commendation for his diligent and untiring efforts in our behalf. I desire to thank the members of the special committees which I have appointed, and the members of the Executive Committee for the efficient and cheerful matter in which they have performed the duties which I took the liberty of assigning to them.

In conclusion I would say that while some of my actions have not met with the hearty approval of all of the members of this association that I would have desired, and that possibly my judgment may have erred, still I derive the greatest satisfaction from the thought that I have at no time been actuated by a selfish motive, but rather by a sincere and earnest desire to advance and enlarge the sphere of influence upon this association.

Report of Secretary.

Following was Secretary Gracey's report:

In submitting my report to you at this, our third annual convention, I feel as I imagine Rip Van Winkle did after his long slumber, when he woke to find things so changed and matured. So I feel to-day when I look back over the work and happenings of the past three years of our State association's life, and there has been a wonderful change, for the better there is no doubt. My work has been materially different the past year than that of preceding years. Our association to-day is a recognized power not only in our own glorious State, but the influence of our work is also felt in other States where affiliation by association has long been in vogue.

During the year I have received over 200 letters from prominent heads of Eastern associations, wishing to know the secret of our success as an association, also requesting that I write them in detail as to how we adjusted our differences between ourselves and the wholesale dealers and ourselves so amicably. To answer such letters intelligently I assure you has required no little diplomacy of itself. I judge it will come as a surprise to our members assembled here to-day when I state that your secretary has, during the past year, sent out from his office 5725 letters. Matters have arisen during the past year which rendered it imperative that every member in the State should be kept in close touch from time to time with affairs through your secretary, and I feel as though it has been an education to all of us.

I appreciate the prompt and intelligent way that our members have responded to communications sent them from this office, and I feel as though I knew all of the members personally; I assure you I would like to. The duty of a State secretary, as I take it, is to keep in constant touch with every member, for in this way we all of us are drawn closer together, and when occasions arise

HENRY GRACEY, Secretary.

where our full and undivided strength is needed to intelligently cope with a difficulty, we are not "found wanting."

A MEMBERSHIP OF 350.

On February 15, 1901, our State association was organized by the affiliation of two local associations—the Pacific Retail Hardware Association, with 78 members, and the San Francisco and Oakland Association, with 20 members, making a total of 98 members. To-day we have affiliated with the State association eight local associations, with a membership of 350 good, wide-awake and intelligent members, thus making an increase of 66 members for the year. Is this not a glorious awakening?

Personally, I wish to express my appreciation of the officers and members of the association who have always been ready and willing to assist me in my duties, thus making my work far more pleasant while endeavoring to serve you. Your executive and subcommittees have been called together some eight or nine times during the year to try and adjust difficulties that have arisen from time to time, and I am positive that our entire association would be as a unit with them in their hour of trial if they could have been present at these meetings.

I wish to speak right here of our president, for whom

H. C. BENNETT, Treasurer.

I have the highest regard, for the noble, straightforward and honest way in which he has stood at the helm; and, although being so far distant from the city, he has at all times taken an active interest in our affairs, and I know personally that, to the detriment and loss of his own personal affairs, he has always been ready and willing to do his duty by you.

I feel to-day like a student who has mastered a favorite study and sleeps with the book under his pillow for fear the knowledge reaped therefrom will leave him; so also with myself in regard to association work, I have felt a pardonable enthusiasm grow stronger within me to grasp all the knowledge I could that would be of benefit to our members and our work.

Treasurer's Report.

H. C. Bennett, treasurer, presented the following report:

Received during the year, as per capita of $5 on 242 members	$1,210.00
Received from voluntary subscriptions toward State Fund	411.00
Balance carried over from last year	.30
Total	$1,621.30
Total expenditures to date	1,569.35
Balance in treasury	51.95
Total indebtedness to date, not including expense of the present convention	$300.00

Auditing Committee Report.

Messrs. Gutman and Fisher, as Auditing Committee, reported as follows:

We, the Auditing Committee, beg leave to submit the following report. We have examined the books of the secretary and treasurer of the State Association, have checked up the receipts and vouchers, and find the books kept in good shape and absolutely correct. The balance of cash on hand corresponds with the amount deposited with the bank.

Executive Committee Report.

The report of the Executive Committee was as follows:

Your Executive Committee, elected at the last annual convention, beg leave to submit at this, our third annual meeting, the following report and recommendations:

A special committee appointed at the last session of the State Association, of which G. A. Johnson was chairman, with the object in view of investigating the Paint and Oil conditions, reported to this Executive Committee that they were unable at that time (February 11, 1903) to do anything in the premises.

About February 18, 1903, at the earnest solicitations of the officers of the Southern California Association, the president, Roy Hall, appointed a special committee, consisting of Vice-President William F. Lutz, the ex-president, O. F. Sites, and the ex-vice-president, G. A. Gutman, to which was afterward added the president, Roy Hall, to meet with the Southern California Association at their annual convention, held in the city of Los Angeles, with the purpose in view of stimulating association work in the southern portion of our State. It appears by the report made by this committee to the Executive Committee that much good resulted at that time through this visit.

This has been the only effort that it has been possible for your Executive Committee to make along the line of organization work. We have, however, endeavored to keep closely in touch with conditions existing in various localities throughout the State, and herewith present for your consideration reports prepared by members of the Executive Committee, who represent the several district organizations:

REPORT OF SOUTHERN CALIFORNIA RETAIL HARDWARE AND IMPLEMENT DEALERS' ASSOCIATION.

Your committee of Southern California have to report that the Southern California Association is in a very dilapidated condition, and we believe radical changes are necessary.

1. On account of the interests of Los Angeles dealers clashing and being so much different to the interests of the country dealers.

2. Because the so-called jobbers of Los Angeles are the strongest competitors of the retailer.

3. We think that Southern California should be provided with local associations.

4. In our opinion the corner grocery store with $500 Hardware and Implement stock should become a member as well as the man with $50,000 stock, and that no effort has ever been made by the State Association or the asso-

JOHN C. WHITE, Executive Committee.

ciation of Southern California to get them to become members.

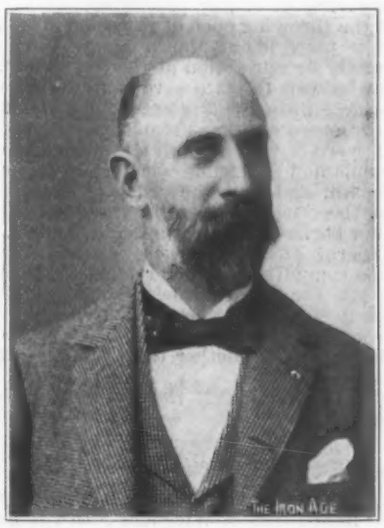
We further believe that the dealer with the $500 stock of Hardware should not be expected to pay the same dues as the dealer with $50,000 stock, and if this State association, through its Executive Committee, would send to Southern California a good and competent organizer, we have no doubt that we could gain a membership of at least 200. As it stands at the present, we have not 25 per cent. of the dealers belonging to our association.

During the last year there were five complaints brought to the attention of the Executive Committee of Southern California by the different dealers of different sections of our country, and all five were amicably settled with the jobber and to the satisfaction of the complainant.

SAN FRANCISCO RETAIL HARDWARE DEALERS' ASSOCIATION'S REPORT.

Reviewing the work of the year just closed, the San Francisco Retail Hardware Dealers' Association is pleased to report that they have held their regularly monthly meetings, and, with the exception of a few minor matters, the year's work has been one of general benefit and satisfaction to all of our members.

The list of commodities covered by our local schedule of prices on Tools, &c., has been continually increased and the adopted prices set upon this class of goods generally well maintained, thus giving to our members a legitimate



ARTHUR L. NICHOLS, Executive Committee.

profit, which prior to the establishment of this price schedule they did not enjoy.

We are pleased to report that with one exception the wholesale houses have remained out of the field in the Builders' Hardware line, and have shown a general disposition to work in harmony with our association. It is hoped that during the coming year conditions and arrangements will be arrived at which will result in the same protection to and noninterference with the interests of our members from all of the wholesalers handling this line of goods. The Builders' Hardware Chapter of our association has recently found it necessary to dissolve the Nail agreement, which had been in effect for several years past between it and the wholesale dealers, for the purpose of reconstruction on a more permanent basis.

We regret that we cannot report at this time any specific progress as having been made in the matter of inducing the wholesale dealers in Stoves and furniture to desist in the present practice of the general retailing of these lines of goods to the consumer.

At a special meeting called September 12, 1903, an agreement was drawn up by the wholesale dealers represented, outlining the conditions under which they would be willing to withdraw from the retail trade. This agreement was as follows:

Memorandum of Suggested Changes Offered by San Francisco Jobbers of Stoves and House Furnishing Goods, in Proposed Agreement Offered by California State Retail Hardware Association, in re. Jobbers Discontinuing Retailing of Goods, to be Submitted to Said Jobbers.

The retailers are to agree to confine their purchases in the lines handled by the California jobbers signing proposed agreement to said jobbers. In cases where retailers hold agencies for any particular make of goods, such as Stoves, Ranges, Oil and Gas Stoves and Heaters, Refrigerators, &c., interested jobbers agree to add said lines to their stocks. In order that retailers may not suffer any hardship by reason of proposed changes in method of doing business, the retailer to nominate a jobber signer to the proposed agreement now handling similar lines, to whom said agency shall be transferred; said jobber agreeing on his part to protect retailer in the agency of such transferred lines in the city where said retailer is located.

If the proposed changes are agreed to by the parties interested, agreement is to become effective January 1, 1904; this for the purpose of giving all parties concerned time in which to remodel the policy of their business in conformity to agreement as expressed, and it is understood that retailers are not to place orders with Eastern manufacturers or jobbers between now and date above mentioned for goods seasonable after said date.

This proposition, with one exception, was acceptable to the special committee delegated by the State Association to met with them. The exception noted was the request of the wholesalers, that we induce the large furniture houses in San Francisco who have exclusive agencies on Stoves to turn such agencies over to the wholesalers and to draw these goods from them as needed.

As the furniture dealers would have nothing to gain in having the wholesale Stove and furniture dealers stop retailing, and as they would be sacrificing both profit and evade prestige in giviug up their present agencies, it is not reasonable to expect them to enter into any such arrangement for the sole benefit of the retail Hardware dealers.

We must of necessity, therefore, take exception to this stipulation of the agreement presented to us by the wholesale dealers. Aside from this, their proposition seemed fair and equitable and would in all likelihood be acceptable to our membership. It is hoped, therefore, that the wholesale dealers will find it to their interest to eliminate this one impracticable feature of their proposal.

Our association is in harmony with the State Association work, as has been evidenced by its action in voting unanimously its support of the recommendations of the State special committee in its recent deliberations.

We realize that the success of our State organization and its work is dependent entirely upon the loyalty of each individual association and its members, and shall at all times recommend such united action as will result in the greatest good for the greatest number.

REPORT OF THE ALAMEDA HARDWARE ASSOCIATION.

Representing the Retail Hardware Association of Alameda County, we desire to report as follows:

The Alameda County Retail Hardware Association was organized about one year and a half ago and still continues its existence, but not under the favorable circumstances so necessary to make it thoroughly successful. While we have a majority of the dealers enrolled as members, there are a few who have up to the present time steadfastly refused to join. This, of course, prevents carrying into effect the full objects of such organization. Those of us who have banded together are well satisfied that the objects sought for can be obtained, if all the dealers in any community will join hands and work for the common good.

This is the spirit that has prevailed among those who so far have composed our association. There is practically only one firm who are now standing out, as the others have signified their willingness to come in if this one

M. M. BROWN, Executive Committee.

firm will join. In the meantime those of us who are loyal to the Hardware interests of the State are determined to keep our organization intact, and hope that we may have the support and assistance of the State organization in persuading this one firm to join, which would be the means of completing and strengthening our association. We have used every means within our power to secure the membership of this firm, but owing to our failure, and not having a complete organization, we have not enjoyed the benefits that should and would have accrued.

REPORT OF SAN JOAQUIN VALLEY RETAIL HARDWARE ASSOCIATION.

In behalf of the San Joaquin Valley Retail Hardware Association, we beg to report that the association generally is in a flourishing condition. Quite an addition

has been made to the membership in the past year. We feel, however, that a visit from a State organizer—should such an office be created—would add to the enthusiasm already manifested, and also get in such material as is now on the outside in small towns.

Very few grievances have been reported. There are certain lumber dealers in the smaller towns who have had a small stock of Shelf Hardware, or possibly no stock, but have secured goods which they are distributing to contractors at a very small profit or no profit at all, to the detriment of legitimate dealers. Some of the planing mills also are repaidly becoming a serious menace to our business. One planing mill put in a car of Nails some

CHAS. W. BARRETT, Executive Committee.

time ago and has been quoting contractors below our schedule card prices. They also have Shelf Hardware, Locks, Butts, &c., which they use as a bait to secure mill work.

This practice must certainly be stopped if possible, and we urge upon this State Association to give such support as will effectually accomplish this result.

In the main, a happy condition of affairs exists in our association.

REPORT OF PACIFIC RETAIL HARDWARE ASSOCIATION.

In accordance with request we take pleasure in laying before you the present status of the Pacific Retail Hardware Association.

Our annual meeting took place this year at Sacramento, at which 61 of our members were present, and in brief will state that the utmost harmony prevailed.

The Wagon and Implement agreement was ratified and entered into for another year, and it is with pleasure that we have to report that great satisfaction was expressed as to the result of that agreement.

One of the principal features of the convention was the discussion which ensued on the subject of the disruption of the Iron and Pipe agreements, and the threatened disruption of the Wire and Nail agreements, and the unanimous stand taken by the members present in which they agreed to uphold the recommendations of the Special Committee, which were to distribute our business with members of the wholesale association who had remained faithful to the association.

It was then shown that the Pacific Hardware & Steel Company had withdrawn from the Iron and Pipe Agreements, and that they had given notice of their withdrawal from the Wire and Nail agreement which was to go into effect about February 5.

You are aware of the result which would follow such a withdrawal and its effects on the retailers, which would be disastrous and far reaching.

The classifications and differentials, which our association originally promoted and which were up to this point supported for the past six years, by every Hardware organization, both wholesale and retail, in the State, were now threatened with destruction.

The Executive Committee of the State Association considered it proper to take up this matter at once, for which purpose they met in San Francisco, and, after a full discussion with the representatives of the Pacific Hardware & Steel Company, and also the members of the wholesale trade, finally agreed to the following stipulations:

That a truce be declared pending the general convention of all members of the retail associations; on the part of the Pacific Hardware & Steel Company, they withdrew their resignation from the Wire and Nail Association until after the general convention.

The foregoing represents the situation as it now stands, and it is for us to decide at the general convention what course will be pursued. It is well to bear in mind the following facts:

1. That the wholesale association remains intact with the single exception of the Pacific Hardware & Steel Company, and is willing to keep in effect the classifications and differentials which existed prior to November 4, 1903.

2. That every retail association is also desirous to maintain and even enlarge those differentials.

3. That the wholesale association has been forced to throw open all prices on Iron commodities and Pipe, thereby depriving us of any protection.

4. That the throwing open of prices on Wire and Nails, &c., will take place about March 5, unless we can avert such a calamity by our action at the convention.

It might be well to state here that the reasons given by the Pacific Hardware & Steel Company for their action were presented by their president and were fully discussed, and were regarded by all as founded on extremely selfish grounds and untenable when viewed from association standpoint, and that the charges of unfair play on the part of the other members of the wholesale association were not borne out by any specific charges, and nothing but general allegations were made, which, to the minds of the committee, were far from being proved.

Having laid the situation before our members, it now remains for them to say whether they are willing to try and improve the situation by united action at the forthcoming convention, or whether they, by inaction or otherwise, will allow themselves to be deprived of the benefits of association work, which they have enjoyed for the past six years.

We deemed it alvisable on March 14, owing to the ruling made by the Trans-Continental roads, covering the shipment of mixed cars of Wire and Nails, to instruct our secretary to write a letter to the members of this association covering the situation, and to impress upon them not to lose sight of the fact that whenever a carload of goods is shipped from St. Louis or Chicago, the California State jobbers were losing that much ground; and, we must not forget that inasmuch as these jobbers are giving us protection on these goods, it is our duty to reciprocate by buying such goods from them and no one else.

In May this association was confronted with a possi-

R. BARCROFT, Executive Committee.

ble disruption of the Iron and Metal agreement, and consequent loss of differentials, owing to the fact that the Judson Mfg. Company were not, at that time, members of the San Francisco Iron and Metal Association. The president appointed a special committee to take this matter up, and their efforts were so far successful that the Judson Mfg. Company has been since that time, and is now, an active member of the San Francisco Iron and Metal Association.

About this time some little dissatisfaction existed on the Wire and Nail agreement, resulting from the fact that John A. Roebling Sons Company, while they had agreed

to uphold association prices, did not consider themselves governed by all the rules of the Wire and Nail Association, and misunderstandings were the result. Your committee called John A. Roebling Sons Company's attention to that fact, and immediately they consented to be governed by association rules and have since become members of that association.

At the last meeting of this State Association members of the San Francisco Iron and Metal Association agreed to comply with our request that no prices would be thrown open without first having a consultation with

JAMES W. HELLMAN, Executive Committee.

this Executive Committee. On August 14, without having consulted this committee, the San Francisco Iron and Metal Association caused to be thrown open throughout the San Joaquin Valley the protective price on iron. Fearing that this condition might prevail throughout the entire State, it was deemed advisable that a special committee meet in San Francisco with the members of the San Francisco Iron and Metal Association (which meeting occurred Thursday and Friday, September 10 and 11) and prices and conditions were again restored.

At this time this same special committee having assisted in bringing about an amicable adjustment of the differences in the Iron Association, deemed it advisable to take up the question of

RETAILING OF STOVES, TINWARE AND KITCHEN UTENSILS BY THE WHOLESALERS OF SAN FRANCISCO.

A meeting was held with the wholesalers in these lines, at which time suggestions and agreements for future action were submitted by both sides—final action to be taken at a future meeting. This meeting was held March 6, between the members of the Executive Committee and the representatives of the wholesale Stove and Tinware dealers, at which time we submitted a proposition to them, clearly defining our object and aim—*i. e.*, the defining of a line between the wholesaler and retailer.

Considerable discussion took place at this meeting, and an adjournment was taken for a few hours to enable the representatives of the wholesalers to consult with the directors and managements of their respective firms.

Upon reconvening, Mr. Watkins, representing the firm of W. W. Montague & Co., stated in effect that they would not withdraw entirely from the retail business, but that they would desist from retailing in the country, although it would be their intention to continue the retailing of goods in the city of San Francisco. He stated further that his firm would set their retail prices at a figure agreeable to the retailers and would rebate to the retail dealer handling their goods in San Francisco the difference between the wholesale and retail prices. As it was the aim of your Executive Committee to establish a principle of a dividing line between the legitimate trade of the wholesaler and retailer, we could not accept the proposition submitted by this firm.

Mr. Wheeler, representing the firm of Holbrook, Merrill & Stetson, following the remarks of the representative of W. W. Montague & Co., stated that, after due and deliberate consideration of the question at issue, his firm had decided to concede to our association the request made of them by your Executive Committee, and as a result would immediately take such steps necessary to entirely discontinue selling all goods at retail to the consuming trade.

Inasmuch as this policy is of itself a new one in this branch of merchandising, their firm stated that this agreement on their part would remain in force for a period of at least one year; during which time they would be able to determine whether or not it would prove to be a profitable venture.

In the meantime, we would most urgently recommend to our entire membership to give to this firm, as much as possible of their business in return for the initiative position which they have taken among the wholesalers handling principally this line of goods. We feel that by this action they have shown a spirit of protection to the interests of our members and trust that our entire membership will encourage similar action from other firms by their loyalty to the house which has so graciously met our request.

IRON AND PIPE AGREEMENT.

Early in November this committee was informed of the withdrawal of one of the prominent members of the Iron and Pipe agreement. Prices on Pipe were immediately thrown open, and fearing the destruction of the existing differentials on Iron and other commodities covered by the agreement, a special committee was called together in San Francisco to inquire into the differences apparently existing and to lend their endeavors to an adjustment of them if possible. The efforts of this special committee at this time proved of no avail.

This special committee, feeling that every member of this association should be made fully acquainted with the conditions as they found them, immediately formulated a report covering the situation, together with recommendations, which has been placed in the hands of all of

WM. F. LUTZ, Executive Committee.

our members. At the suggestion of the San Francisco Iron and Metal Association, and believing that some good might come therefrom, the entire Executive Committee was called together in San Francisco to more fully discuss the unfortunate conditions existing. At this time meetings were held with the parties interested, but we failed to promote harmony. Conditions have continued to become more aggravated and the possibilities of an adjustment more remote. It has been deemed advisable that this matter be taken up fully in the general convention of the State association.

THE WAGON AND IMPLEMENT AGREEMENT,

as now existing between the Wagon and Implement Chapter of the Wholesalers' Association and this retail association, has proven most satisfactory and we anticipate a continuation of the same.

Your committee have the following recommendations to offer for your consideration:

RECOMMENDATIONS.

That you take up and endeavor to have passed through the Legislature a bill, to become a law, similar to that which now exists in the State of Washington—

JOHN P. MAXWELL, Executive Committee.

known as House Bill No. 130—which has particularly to deal with the peddling and trailing of Wagons, Buggies, Stoves, etc., by nonresidents.

We would further suggest that this convention take up and fully discuss ways and means for more thorough organization work.

We would further recommend that the editor of the *Pacific Hardware Journal* be extended a vote of thanks for the able manner in which, through his journal, he has kept us informed of the conditious of the Hardware trade, and that the *Pacific Hardware Journal* again be made the official organ of this association, and that every member subscribe for it.

That inasmuch as *The Iron Age* has heretofore given full publicity to our work and has gratuitously supplied us with 1000 copies of the proceedings of our annual convention, a vote of thanks be extended to them for their generosity.

We would further recommend that after having expended every reasonable effort in endeavoring to have those dealers who are not members of this association to join with us or maintain prices, and we having failed to accomplish this result, that their case be brought to the attention of the Pacific Coast Hardware and Metal Association, and we request the Wholesalers' Association to place them upon the consumers' list until such time as they may see fit to co-operate with our association.

In view of the increased amount of work attached to the secretary's office, your Executive Committee regard the salary of its secretary as inadequate and recommend its increase.

We find that the effort of our association in limiting the distribution of Builders' Hardware exclusively among the retail dealers has met with very little success during the year just past. The Executive Committee have, on several occasions, taken up this matter with the parties interested, but have, up to the present time been unable to change the conditions. We would state for your information, however, that we hope in the near future to bring about a change in the existing conditions. We would state for your information, however, that we hope in the near future to bring about a change in the existing conditions which will greatly improve the situation. We would recommend, therefore, that this convention solicit an expression on this subject from the parties interested therein.

It is recommended that this convention take into consideration the present attitude of the Pacific Hardware & Steel Company in their action in withdrawing from the Iron and Pipe agreement, and their notice of withdrawal from the Nail and Wire agreement, and its effect on the interest of the Retail Association, and that a full and free discussion be invited so that every phase of the situation be thoroughly understood and accordingly acted upon by the convention.

All the above reports were, on motion, ordered accepted and filed.

Election of Officers.

The Nominating Committee appointed by the president then submitted their report, as follows:

PRESIDENT, O. F. Sites, San Francisco.
VICE-PRESIDENT, G. A. Gutman, Orland.
SECRETARY, Henry Gracey, San Francisco.
TREASURER, H. C. Bennett, San Francisco.
EXECUTIVE COMMITTEE: James W. Hellman, Los Angeles, and William F. Lutz, Santa Ana, of the Southern California Association; John C. White, Marysville, and A. L. Nichols, Chico, of the Pacific Association; Chas. W. Barrett, Fresno, and R. Barcroft, Merced, of the San Joaquin Valley Association; C. M. Brown, Hollister, and H. E. Robinson, Hollister, of the Central Association; M. M. Brown, San Francisco, and C. H. Philpott, San Francisco, of the San Francisco Association; J. P. Maxwell, Oakland, and G. H. Smith, Oakland, of the Alameda Association; J. C. Mailer, Santa Rosa, and J. H. Steves, St. Helena, of the North Coast Association; J. E. Janssen, Eureka, and H. E. Reid, Eureka, of the Humboldt Association.

These gentlemen were unanimously elected by acclamation.

Parcels Post Bill.

The following resolution was adopted:

Resolved, That this State Association work in conjunction with the Pacific Coast Jobbers' and Manufacturers' Association along the lines outlined by them, and that

J. E. JANSSEN, Executive Committee.

they be requested to furnish us with a quantity of the pamphlets issued upon this subject for distribution among our members.

House Bill No. 130.

The following resolution was also adopted:

Resolved, That the president of each local association in this State delegate committees to confer with their State Assemblymen in an endeavor to have a bill passed in the Legislature of this State, similar to the one now existing in the State of Washington, known as House Bill No. 130.

Stoves and Tinware.

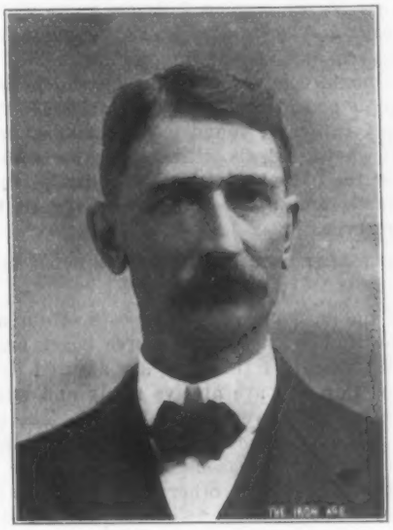
Following the suggestions contained in report of the Executive Committee, the president appointed Messrs. Hellman of Los Angeles, Brown of San Francisco, Max-

well of Oakland and Janssen of Eureka as a special committee to carry on the work, it is hoped, to a successful issue.

Montague & Co. Will Abandon Retailing.

S. F. Grissim, representing W. W. Montague & Co., briefly addressed the convention as follows:

I come before you as a representative of W. W. Montague & Co., after having talked with some of your committeemen here to-day, and afterward with the members of my firm and Mr. Watkins. They have decided to join in with you and not retail any goods in the State of California. They asked me to convey this news to you and



C. M. BROWN, Executive Committee.

said that the detailed arrangements would have to be determined by themselves and a committee you may appoint to come before them; some little matters will have to be looked into, but the special part is that they will not retail any goods in the State.

Constitution Amended.

Section 1, Article 3, of the constitution, on motion, was amended to read as follows:

The Executive Committee shall consist of the president, vice-president, secretary, treasurer and two members from each local association affiliating with this State Association and who shall be elected at each annual meeting.

A motion for a joint conference with the wholesalers on Thursday afternoon was defeated.

The convention adjourned until Thursday morning.

THURSDAY MORNING SESSION.

Representatives of the wholesale Paint and Oil houses addressed the convention. Mr. Fuller of W. P. Fuller & Co. said that his firm desired to do all in their power to adjust matters satisfactorily, and any suggestions as to how that could best be accomplished they would be pleased to receive. Magner Bros. reported that they stood ready to enter into arrangements of any kind that would prove profitable to the dealers in this line. President Hall, on motion, appointed a committee, consisting of Messrs. Barrett of Fresno, Ingalls of Napa, Legg of Nevada City and Steves of St. Helena, to endeavor to secure similar classifications and differentials as are enjoyed in other lines.

The request of J. W. Hellman of Los Angeles for an organizer to visit Los Angeles and Southern California was referred to the Executive Committee.

Builders' Hardware.

The following resolution was adopted:

Resolved, That a communication on the retailing of Builders' Hardware be immediately forwarded by this association to the Pacific Hardware & Steel Company, requesting from them in writing a statement as to their position on this subject.

The following reply to the communication was received from the Pacific Hardware & Steel Company:

We take this opportunity, while your convention is in session, to communicate to your entire membership the fact that we have about consummated arrangements to retire from the sale of Builders' Hardware to the consumers in San Francisco. While we have found it necessary to sell such goods in this way, we have frequently promised that as soon as arrangements could be made to handle our lines through the retail trade this opportunity would be seized; such arrangements have now been made.

In connection with this it will also be of interest to learn that we have about effected the sale of the H. E. Skinner Company, now the Olympic Arms Company. We feel that this action of ours removes all differences that can possibly exist between us, and hope you will recognize herein that we have always met you in good faith and carried out the promises that have been made you from time to time—namely, that we would retire from any retailing whatever at the first opportunity.

Wishing you a successful session, &c.

THURSDAY AFTERNOON SESSION.

Mr. Turner addressed the convention with reference to an association being organized in the city of Stockton. Mr. Biggs recommended that this district be included in the Pacific Retail Association.

The matter of Shelf Hardware in San Joaquin Valley was referred to Mr. Barrett of Fresno.

A resolution increasing the salary of the secretary to $600 per annum was adopted unanimously.

The following was also adopted:

Resolved, That a vote of thanks be extended to *The Iron Age* for the many courtesies received at its hands, and also to the *Pacific Hardware Journal* for the many favors rendered.

Communication from Central Association.

The following communication from H. E. Robinson, Gilroy, secretary of the Central Association, was read:

Below are some subjects which were discussed at our meeting in Salinas, March 16, 1903, and which I have been requested to present to the State Association for discussion at the annual meeting in San Francisco, March 2:

1. For the benefit of our members who have a plumbing department, the advisability of our seeking co-operation of the Master Plumbers' Associations in gaining protection and other advantages enjoyed by master plumbers in the larger cities.

2. Regarding steps to be taken to prevent selling of goods to commission merchants by jobbers.

The following resolution was adopted by unanimous vote at our annual meeting at the Grand Hotel, Tuesday, March 1, 1904:

J. H. STEVES, Executive Committee.

Whereas, One of the greatest disadvantages to the retail Hardware dealers in California arises from the existence of jobbing houses who make a practice of selling goods at retail; and,

Whereas, There are houses who do a strictly jobbing business and show in this way a commendable fairness to their customers, which is, however, only just; therefore be it

Resolved, That it is the sense of this association that in discussions coming before the meetings of our State Association due recognition should be given to this friendly spirit exhibited by certain jobbing houses; and be it further

Resolved, That a copy of this resolution be handed

the secretary of the California State Retail Hardware Association, and he be requested to read it before the annual meeting of that association at the California Hotel on March 2, 1904.

The following resolution was also adopted:

Whereas, It has become a practice for the representatives of certain San Francisco Hardware jobbing houses to sell to the regular grocery trade and to interest them in the introduction of goods in the Hardware line, which they almost invariably sell at grocery profits; and,

Whereas, We consider this unfriendly and unjust to the regular Hardware trade, to which these jobbing houses look for the bulk of their business; therefore be it

Resolved, That our association request the Executive Committee of the California State Retail Hardware Dealers' Association to take this matter up with the several Hardware jobbing houses in San Francisco, with a request that it be discontinued.

Why the Retail Hardware Merchant Should Work in Harmony With the Wholesaler Provided the Latter Performs His Duty Toward the Former.

J. W. Hellman of Los Angeles addressed the convention as follows:

The Executive Committee having honored me with the request for a paper to be presented at this meeting, and having accorded me the privilege of selecting my subject, I take the liberty of expressing a few ideas as to "Why the

J. C. MAILER, Executive Committee.

retail Hardware merchant should work in harmony with the wholesaler, provided the latter performs his duty toward the former." Such comments and suggestions as I may make are the result of personal business experience and observation in my own section of this great State, and you will certainly treat as entirely disinterested and unbiased the assertion that that section, and particularly the city of Los Angeles, is one of the brightest, snappiest and busiest communities on the Pacific Coast, and that the activity, energy and ability of her merchants, both wholesale and retail, are such that special aptitude and capacity is required upon the part of any one who would successfully follow a mercantile pursuit within her confines.

To live anywhere in the Golden State is indeed a privilege of the highest character, but to enjoy the manifold blessing of residing in the southern portion thereof is little short of an indulgence in heavenly bliss, not alone because the jobbers and the Almighty are good to us, but because, however short our rainfall, the crop of individuals seeking a pleasant place to spend their money and develop our resources is usually above the average. With the modesty becoming a resident of Los Angeles, I will not attempt to recite to you her many advantages and virtues, but will repeat a story which well illustrates her attractions.

A prominent stranger having been admitted through the Pearly Gates was being shown the sights by St. Peter, and as they walked down one of the gilded boulevards they passed a beautiful grass-spot in which several individuals were chained, after the fashion of the elephant at the circus, which excited the curiosity of the distinguished visitor. He said to Peter: "Why are these people, amid such beautiful and entrancing surroundings, chained in that apparently cruel manner?" His host replied: "Why, they are from Los Angeles, and we are afraid they will return again."

Recurring to the subject, the retailer feels—and justly—that the question of his relations with the jobber is largely dependent upon the latter. Each has his field of operations—the one with the customer, the other with the trade—and the jobber who persists in leaving his legitimate field and engaging as a competitor with the retailer, in my opinion, kills the goose which lays the golden egg, and certainly cannot complain at the loss of confidence and respect in the latter. Of course, no retailer should complain of sales by the jobber to what is ordinarily considered "wholesale trade," such as steam and street railways, foundries, machine shops and the like; but when he deals with the smaller contractor, the farmer or the householder he goes entirely beyond legitimate bounds and necessarily incurs the ill will of his retail brethren.

TO PREVENT SUCH PRACTICES AND THE EVILS GROWING OUT OF THEM

is one of the most important purposes of our association. Affiliation and friendly intercourse beget mutual confidence, and already I think we are assured that the real jobbers of this city are always ready and willing to co-operate with us in every possible way. The concessions already granted are sufficient proof that so long as our demands are not unreasonable they will be cheerfully complied with. On the other hand, the retailer should be, and as a rule is, loyal to every jobber who maintains toward him the attitude of fairness heretofore alluded to. It is only proper that every retailer should be loyal to the jobbers of his particular locality, and encourage mutual co-operation by dealing with them rather than with distant establishments having no interest in common. By maintaining toward each other such an attitude of mutual co-operation, the outcome cannot be otherwise than the establishment of confidence and co-operation between the jobber and the retailer, which will be of great advantage to both parties.

Required as he is to keep in constant touch with the varying conditions of the market, the wholesale merchant is almost invariably easily approached on trade matters, and is always glad to listen to anything which may tend to improve the condition and situation of those with whom he deals; and in some instances wholesalers go even further than this and seek opportunities to benefit the retailer, of course always by so doing reaping a benefit to themselves.

There are several large establishments in Los Angeles carrying enormous stocks of goods, and as we are all aware that our market is not wide, being cut off by Mexico on the south, the competition of the Eastern jobber on the east, the Northern wholesaler on the north, and being shut in by the Pacific Ocean, our local jobbers necessarily look keenly for a place to dispose of their goods, this desire for trade at times causing them to overstep the bounds of their legitimate field of operations. Our association, we trust, by adopting methods which will not only improve the market, but will bring such jobbers to fully realize the shortsightedness of such a policy, will in due time remove any cause for complaint by the retailer and will bring the latter to look with favor only upon those jobbers who are so in fact as well as in name.

I cannot state too emphatically my firm belief in association work and in its immense benefits to both branches of the trade. Association is always good. In our city the jobbers have a mutual

SCHEDULE OF PRICES,

which gives the retailers fair protection, and the schedule is very satisfactorily adhered to. In such goods as Nails, Sash Weights, Pipe, Iron, Horseshoes, &c., we have enjoyed a very liberal differential, which has made money for us, and the prospect of whose disruption we anticipate with considerable apprehension. Necessarily, we are all

in business for profit, and if a means can be devised by which the volume can be kept up and prices maintained at a fair margin, it is our duty so to do. There is more money made by the Hardware house which agrees upon a schedule of prices and rigidly adheres thereto, thus assuring absolute fairness on all sides, than by the institution which is constantly interfering with the stability of trade by keen, and, at times, questionable, competition in prices. If a merchant does not command the respect and confidence of his fellows he certainly cannot hope to command the respect and confidence of the rest of the business world. If he does, and will meet in associations such as ours and agree upon prices which will afford fair business profit to all concerned, not only is the trade benefited, but he is individually the gainer. This policy is adopted in all other lines of business, and there is absolutely no reason why it should not be adopted in ours. If we can harmonize all the retail interests, rectify trade abuses and get together on matters in which we are mutually concerned, we will certainly reap a larger reward for our efforts.

The retailers of the northern portion of the State are in a better position to carry out complete organization than are those of the south, for the reason that the number and size of the establishments in this portion of the State are so much greater than in our section, and for the further reason that you of the north are more familiar with association work and have already given it considerable time and effort. You have, undoubtedly, found your endeavors profitable and advantageous, and I wish to impress upon the minds of our people the fact that you have so found it, in order that they may be more readily induced to follow your example.

Our city is making giant strides in its marvelous progress, and the present stage of development is indeed a satisfactory and opportune time for efforts at organization, and I trust the efforts will be made and that they will bear good fruit.

In conclusion, let me extend to you a cordial invitation to visit us. Possibly some of you have never been in our city. If you come I am satisfied that our association and city will be a gainer in a number of permanent acquisitions. We can guarantee a royal welcome to you all and will introduce to you some of the brightest and most successful Hardwaremen on the Pacific Coast, among whom will be found jobbers and retailers who are always ready, willing and anxious by every means within their power to bring about conditions which will be mutually satisfactory to both branches of the trade, thus harmonizing the interests of both the retailer and the jobber.

Harmony Among Wholesalers.

The following resolution was unanimously adopted:

Resolved, That this convention earnestly desires the restoration of harmony among the wholesalers and requests that they take such action among themselves as will speedily restore the former satisfactory conditions.

A motion by Mr. Ingalls that thanks be extended to the retiring officers for their very efficient service was unanimously carried, after which the convention adjourned *sine die*.

Entertainment.

The programme of entertainment included a bay excursion for the ladies on Wednesday afternoon, a banquet in the evening at Golden Gate Hall for members, guests and ladies, a trolley ride for the ladies on Thursday afternoon, and a theater party on Thursday evening for members, guests and ladies.

The Ladies' Reception Committee consisted of Mrs. Henry Gracey, chairman, Mrs. A. C. Rulofson, Mrs. H. W. Barnard, Mrs. Geo. Hood, Mrs. C. F. Sherrock, Mrs. J. M. Baker, Mrs. C. H. Philpott and Miss C. F. Quick, assisted by F. Stanley Proctor, chairman, representing Chas. Brown & Son; C. F. Day, representing Baker & Hamilton; Clifford Beatty, representing Pacific Hardware & Steel Company; Will Wisnom and Henry Strobin, representing Palace Hardware Company; C. L. Hewes and W. V. Freeman, representing Dunham, Carrigan & Hayden Company. The Committee of Arrangements, consisted of C. H. Philpott, chairman, E. Jones, M. M. Brown and H. C. Bennett.

BRITISH LETTER.

Offices of *The Iron Age*, Hastings House, Norfolk St., London, W. C., March 19, 1904.

The Week's Hardware Trade.

WHETHER it be the change toward better weather or whether the cause lies deeper, I am at length enabled to report that the general Hardware trade shows some indications of improvement. Employment is better and prices are slightly stiffening. At least half a dozen merchants whom I have seen this week, both in the light and heavy trades, assure me that there is a distinct turn for the better. The money market, too, is becoming a little more speculative, and consols are once more upward bent. There is, of course, an immense leeway to make up, but it is pleasant, at all events, to note a change for the better. The latest official reports on the state of employment in the Hardware trades may thus be summarized:

Brasswork, Bedstead Making, &c.—With brassworkers generally employment is but moderate, though not worse than a month or a year ago. In Birmingham workmen in the Bedstead and Fender branches report it as bad; in the Brass Brazed Tubes branch as fair. In Leeds and Exeter it is reported as fair.

Nuts, Bolts, Nails, &c.—In Birmingham, Smethwick and Wednesbury Nut and Bolt makers report employment as slack. With makers of machine made Nails and Cut Wire Nails at Birmingham it is moderate; at Halesowen and Blackheath it is bad with makers of Spikes, Wrought Nails and Rivets.

Tubes.—In the Staffordshire Tube trade employment remains much the same as it was a month ago, but is worse than a year ago.

Chains, Anchors, Anvils, Vises, &c.—At Cradley makers of cable, side welded and dollied Chains report a slight improvement, but makers of Block Chains are very slack. Chain makers at Gateshead report employment as fairly good. On the Wear anchor-smiths are fairly well employed, but are slack at Cradley. Makers of Anvils and Vises are slack at Dudley, and there is some short time reported. At West Bromwich employment on Springs is fairly good and moderate on Axles, but at Wednesbury employment is slack on Railway Springs, Axles, Coach Iron work and Steel Forgings, and with Bits, Stirrups and Iron work for Harness and Cart Gear at Walsall.

Locks, Keys and General Hardware.—Employment generally with Lock and Key makers is very bad, both at Wolverhampton and Willenhall, and short time is general. In the West Bromwich Hollow Ware trade employment is bad, with short time; at Wolverhampton it is moderate with tinners, turners and galvanizers of Hollow Ware, and with makers of Iron Fences, Hurdles and Vermin Traps; quiet with Spade and Fork finishers and with stampers, piercers and enamelers; with Hollow Ware stampers at Sheffield it is slack.

Files, Edge Tools, &c.—At Birmingham File workers report employment as quiet; at Sheffield as moderate, and at Warrington as good. Edge Tool makers are moderately employed at Birmingham and slack at Sheffield and in the Wolverhampton district.

Stoves, Grates, &c.—Employment is reported as moderate at Birmingham, as improved in the Rotherham district, and as fair on the Tyne and Wear, and rather better than a month ago. At Falkirk and Glasgow it is very slack, and short time is being worked in some cases.

Sheet Metal.—In London most of the workers on Sheet Metal report employment as quiet. In Birmingham employment is moderate; in the Lye district it is slack and worse than a month ago; in Nottingham, Leeds and Exeter it is good; at Manchester, Hull, Edinburgh and Dublin it is fair; at Oldham it is slack.

Cutlery, &c.—The Spring Knife cutlers in Sheffield report employment as fair in the Pocket Knife branch, but most of the other branches are slack. There is a slight improvement in the Razor trade. At Redditch the Needle trade is slightly better than a month ago, but worse than a year ago. In the Fish Hook trade employ-

ment continues good. Needle makers at Nottingham are slack.

GOLD, SILVER, BRITANNIA METAL, &C.—In London the Silver Spoon and Fork finishers report employment as very fair, the other branches as slack or bad. Employment in these trades is also very quiet at Birmingham and Sheffield.

WIRE WORK.—Employment generally with Wire workers is slack or bad. With Wire drawers at Halifax, however, it is fair and better than a month ago.

FARRIERS.—Employment generally is reported as bad; at Ipswich, Chelmsford and Dublin, however, it is reported as fair.

The position of affairs here outlined was exactly the position a fortnight ago. It is, of course, evident that no great improvement can take place in so short a time. None the less, trade is better than it was.

London is at the moment the worst market, but there is a distinct improvement in demand from the big Northern manufacturing centers. In the Eastern Counties, and particularly in the agricultural districts, business still continues at a very low ebb. In Scotland the demand improves for Ironwork, particularly on Scotch farms. In Sheffield the most interesting feature of the trade is the improving demand for quick cutting Steel.

Electrical apparatus is selling well, both in the light and heavy lines, but the cycle trade is languid, a condition which extends to components. On the other hand, motor car components are in brisk demand. Indeed, the motor branch altogether advances by leaps and bounds. There is very little demand for sporting Guns at the moment, but the military branch is now fairly active.

On overseas account, Australian orders are profitable and in good quantity, and New Zealand continues to buy well. If one were to judge by the orders received, New Zealand would appear to be about the most prosperous spot in the British dominions. The Russo-Japanese war is interfering with trade in that part of the globe, but a fair weight of material is being forwarded to India and South Africa. The South African trade has once again taken a slight turn for the better.

Trade with Russia.

The Russo-Japanese War naturally turns attention to the commercial possibilities of that country. It is no part of my business to comment upon the unfortunate fiscal difficulties existing between the American and the Russian Governments. I have more than once pointed out that heavy adverse tariffs seriously restrict trade between the two countries, and Russian manufacturers and merchants have turned to Germany and England to do trade which otherwise would have been done with America. Just now there is a belief prevalent in Russia that Americans favor the Japanese, and this does not make matters any easier. None the less, a considerable volume of trade is transacted, and more can be done if those concerned will endeavor sympathetically to understand the Russian point of view.

Strange Surroundings.

A peculiarity of the Russian merchants, especially of those engaged in the Hardware trade, which strikes the newcomer, and is at first likely to impress him rather disagreeably, is the conditions under which they live. The greater part of the retail business, as well as a considerable proportion of the wholesale, is carried on in all towns in the "rynoks," or markets, which form a separate quarter, and resemble somewhat the Oriental bazaars. Here are seen rows of shops, or, more correctly speaking, booths, crowded together, each trade being confined to one street, so that ironmongers, china dealers, clothiers, &c., each live in their own quarter. To become thoroughly acquainted with the trading grounds is a matter of importance to the enterprising exporter, since a very large proportion of the whole turnover of any trade has its starting point here. No stranger could ever realize the extent of the trade which is carried on. He would have difficulty in understanding that some of the merchants living in these crazy stalls have become millionaires, and yet continue to haggle away in them according to their time honored custom.

GERMAN NOTES.

FROM A HAMBURG OBSERVER.

THE trade in American Hardware and allied lines runs pretty much in the same channels as it always did, with the only exception that competition becomes keener in several lines which are being manufactured here cheaply, and having the advantage of not paying duty can be marketed at much lower prices than American articles.

Competition in Meat Choppers.

The market is full of Meat Choppers, and a German works which make an imitation of the original Enterprise Chopper place these in the hands of the trade at such ridiculously low figures that competition is almost excluded.

American Inventiveness in Statu Quo.

The trade complain much of what I might call a dearth in inventive genius on the part of our American friends of late. The best and leading stores in household and kitchen utensils were accustomed to have at least once or twice a year an American novelty in their line as a leader for the season. Of late years, however, nothing sensational—or, at least, nothing of a striking nature—in that line has been placed on the market. Is it due to good business on the other side of the Atlantic that the inventive genius rests? Is it fear of prompt imitation on this side, or is it due to the rulings of the custom house authorities, who of late years put many American lines into higher classifications than formerly?

Ice Cream Freezers and Tariff Rulings.

Ice Cream Freezers, for instance, used to pay a duty of 10 marks (about $2.50) per 100 kilos (220 pounds). It has been decided that they are to be considered as "wooden ware in connection with iron," and the line pays a duty of 30 marks ($7.50) per 100 kilos now, which is practically prohibitive. German dealers have consequently arranged to receive the pails and the iron parts separately and put them together here, whereby they save a little in duty, but have the work and consequent expense, which naturally make the article dearer than it used to be. This has given an opportunity to some German works to attempt to manufacture Ice Cream Freezers after American patterns here. Some of them (principally the works which make the Meat Choppers mentioned above) make a very good imitation by procuring the pails from some of your Southern works. Others have commenced to buy white cedar slats in the United States and manufacture the buckets here. The metal parts are all made here, anyhow, by these concerns, who have their own foundries and tin plate shops.

One German concern goes further and uses ordinary pine, making a kind of a square pail lined with tin plate, which is carefully jointed and soldered in the corners, making a perfectly water tight pail, which is not apt to dry up and fall apart when not in use. The outside of this square box or pail is nicely lacquered, and I must say it makes a very presentable Ice Cream Freezer.

A Three-Minute Bread Maker.

A novelty which has come to us this season is a Bread Mixing and Kneading Machine made by Landers, Frary & Clark, New Britain, Conn. It is too early yet to say whether this machine will introduce itself in the German households or not, but it appears at first sight to be too expensive to make much headway. The people who bake at home in Germany are, as a rule, the poorer and middle classes, for whom the expenditure of $3 for a household machine is a consideration; besides, the kneading and mixing of the dough give them a sort of pleasure and pastime, and it is a matter of pride with them to produce a loaf of bread or a cake which is altogether their own handiwork. The wealthier classes buy their bread at the bakers' and their cakes at the confectioners', and should they bake at home they have well paid cooks, for whom they buy little or no machinery for kitchen and household use as a rule. It is strange

to say that the cooks and servants, as a rule, oppose most the introduction of machinery in their kitchens, and prefer doing the work by hand in the old fashioned way.

An Insight Into German Economic Conditions.

Another consideration might as well be mentioned here for American manufacturers desirous of conquering the German or European market with any household novelty. It must be cheap to go through. Take into consideration the fact that $1 in the United States is not a large sum, but in Germany it means a little over 4 marks—four of our units against your one—and I should say that people will as much consider the expenditure of $1 on this side as the American does that of $2 in the United States. Then unskilled labor is relatively very cheap on this side, and the saving of time does not cut such a figure as it does in the United States. It does not matter very much in a household whether a Meat Chopper will cut a pound of meat in three or five minutes, or whether an Ice Cream Freezer takes two minutes longer to freeze a quart of ice cream than another. These points, which might conquer the market for a machine in the United States, do not count for much here, and nobody will pay an increased price for a machine or a household tool on that account. It is different when a tool or a machine is made for use in the industries or by mechanics, who by the saving of time can increase their output and consequently their earnings. Such a tool or machine has good prospects of being bought at a price and in sufficient quantities to pay the manufacturer to adapt himself to the requirements of this country.

A Bottle Corking Machine.

A bottle corking machine made by Hugo Reisinger of New York belongs to this category. It is stated that a dealer in Belgium has imported a great quantity of them and sells the machine in large quantities. Germany is more reserved regarding this machine. The reasons are many, and it appears to me it is to an extent the manufacturer's own fault if he should not make headway with it in Germany. The machine works well, and being of good material must, as a matter of necessity, be somewhat expensive. A bottle corking machine, however, is not everybody's purchase, as would be a Cork Puller. I consider it, therefore, a mistake to give a machine of this kind into the hands of every exporting commission merchant simultaneously, and then have it offered everywhere and at the same time by people who on other days of the week sell suspenders or rubber shoes, and are neither acquainted with the Hardware trade nor familiar with its requirements. A machine of this kind should be put in the hands of specialists who have sole control in their districts. The number of buyers being limited, they must be seen and interested, each individually. At the price at which this article is offered it appears too dear for wine or beer bottlers, who can buy a large machine doing considerably more work for only a few dollars more—of German manufacture, of course. The Reisinger machines may be sold to bar rooms and private families—by specialists, of course—and that business can be handled by a special agent only. It is a pity to see an otherwise good article spoiled by inadequate methods.

Enameled Ware.

One of the most important lines in the Hardware trade of Germany, and one in which a big business is done at home as well as for export, is Stamped Hollow Enameled Ware, called "Emaille" for short. Germany supplies the world with this line, and a special export quality is made for the purpose. It does not seem that American manufacturers, although syndicated to a great extent, as the Germans are, can compete in this line, which is sufficiently proven by the fact that enormous quantities of Enameled Ware are exported to the United States every year from Germany. I understand that the reasons for this are very numerous. In the first place, it is stated that much of the American Enameled Ware is double coated, while the German export quality is prepared by a special method, and, although single coated, is not less durable than the American makes.

ADAPTATION OF SHAPES AND SIZES.—Secondly, it is said that Germany has adapted its manufacture to the shapes, sizes and forms desired by South American and other countries, while American manufacturers insist that shapes salable in the United States must also go elsewhere.

GRAY ENAMELED WARE OR NOTHING?—As a third reason, I am told the American manufacturers insist on selling gray Enameled Ware principally, while foreign countries prefer white-white, blue-white and similar light colors. Germany itself uses a good deal of white-white and blue-white, but one can see also much gray ware (largely imported from Vienna, Austria and Bohemia), and also a dark brown, the special color of a Bavarian works making a high class quality. Of late a factory in Rhineland has brought out a black-blue kind of Enameled Ware, which is said to be of very good quality, and is seen much in the leading stores.

OTHER HANDICAPS.—The American manufacturers are under many more disadvantages than enumerated above as far as import into Germany is concerned. With their ware I understand 92 per cent. is cost of raw material, while 8 per cent. is labor, while with the Germans these figures are much more advantageous to the manufacturer. Then, the Germans are able to put their goods loosely on the cars at their factories and ship to the trade, in that way saving the cost of packing. Americans must pack the goods in boxes, pay ocean freight and duty.

BUYING SHAPES FOR ENAMELING.—Of late German enameling works have been buying black forms ready for enameling from English stamping works. This refers especially to the larger sized goods, Pails, &c., for which not all German works have large enough dies. American manufacturers, especially the National Enameling & Stamping Company, whose attention has been called to this new opening, have bid on part of this business, but it is understood they have not been successful, for the reason that they would not sell by weight, but simply by the dozen or the gross, while the Germans buy black forms by weight only.

CAST IRON ENAMELED HOLLOW WARE.—Cast Iron Hollow Ware, enameled inside, is a line which is furnished in large quantities and of excellent quality by some English manufacturers now. Only the very best quality passes in that line, however. Germans and Austrians are good competitors in this line, but their wares are not so much in vogue as are the English goods.

German Enameling Syndicate.

Most of the German enameling works are members of the Enameling Syndicate, which maintains an export office at Hamburg and a central office for domestic affairs at Berlin. These are, however, sales offices only. Purchases are made by the individual works as a rule. A movement is on foot to bring all of the outstanding works into the Enameling Syndicate, and negotiations are in progress which promise success in this direction. As soon as this arrangement is perfected it is planned to advance the prices of Enameled Ware 10 per cent., with prospects of a gradual rise of 20 per cent. additional in the course of the year. Whether this programme can be carried out will depend, of course, upon the general condition of the iron and metal market.

An Era of Prosperity Expected.

Germans are very sanguine of better business and better prices, and an era of prosperity seems to be dawning again upon this country.

MISCELLANEOUS NOTES.

Novel Pocket Knives.

Graef & Schmidt, 107 Chambers street, New York, sole agents in the United States and Canada for J. A. Henckels, Solingen, Germany, are offering a unique knife, Twin's brand, the handles of which are sawn from a solid piece of ivory, pearl or tortoise shell. There are no bolsters, and as the linings and back are in one piece, there is nothing but the blades, springs and rivets besides the handles, all blades necessarily being on one side. One of ivory is 3½ inches long, 5/8 inch wide and about 9-32 inch thick. This knife has three blades and a nail file, the two pairs of blades being separated by a partition of

ivory. The pearl and tortoise shell patterns have but two blades, owing to the impossibility of getting this material thick enough to accommodate four blades. This pattern, much smaller, is also made for ladies' use, with two blades in shaded ivory, 2⅜ x ⅝ x 3-16 inches in outer dimensions, and another of the same material 2½ x 9-16 x ¼ inches, with two blades and nail file.

Hollow Point Bullet Cartridges.

The Union Metallic Cartridge Company, Bridgeport, Conn., and 317 Broadway, New York, are making a special feature of Hollow Point bullet cartridges in .22 and .25 calibers, which they recommend as particularly adapted for shooting small game, such as rabbits, squirrels, &c. They cost but 50 cents per 1000 more on the list than the ordinary rim fire cartridges, subject to the same discounts, and the company confidently anticipate a popular demand for them as soon as the jobbers and dealers become aware of their intrinsic merits. They are made in .22 short, long and long rifle and .25 Stevens, with black powder, and .22 short and long, loaded with smokeless powder, all having hollow point bullets. Some of the calibers have recently been put on the market, the first styles made having gone abroad principally. With such small calibers there is an advantage in stopping game to have a bullet that will spread or "mushroom" instead of going clean through with less shock.

Colored Celluloid Thumb Tacks.

The Hawkes-Jackson Company, 82 Duane street, New York, manufacturers of thumb tacks in brass and nickel, eyelet pliers and eyelets, brass paper fasteners, &c., sold under their trade-mark, Solid-hed, have just added to the line a series of thumb tacks with heads of colored celluloid covering the regular metal head. The heads are 9-16 inch in diameter, in red, white, blue, green, buff and black. They are artistically put up in display container, to stand, or hang on wall to sell from, in 3 gross assortments, a dozen each on a paper covered block, thus requiring little attention from the dealer in selling. Aside from the customary use of thumb tacks for draftsmen in holding paper on a board, they are now being largely used for map marking, holding draperies in position, fastening desk blotters down, holding unframed prints, pictures, calendars, &c., neatly against a wall without perceptibly marking it, and other kindred uses. The company contemplate getting out a smaller size in the near future, with ⅝-inch heads, for marking maps in routing salesmen.

The Improved Putnam Nail.

The Putnam Nail Company, Neponset, Mass., have always considered it of prime importance to have their nails drawn down on all four sides alike. This was the "hot process," and they have now adopted it in the "cold process." The company make the point that by drawing the nail down on all four sides alike with a drawing roll the tenacity and holding power of the nail are greatly increased, whereas, if a blank is made and the nail then produced by rolling down on one side only the molecules of the iron are disturbed and the nail has not the same holding power. The company refer to the new Putnam nail as possessing all the advantages of the old, with absolute uniformity both in set and finish, and as being a fine driving nail. In view of the tendency for manufacturers to sell directly to consumers, jobbers and merchants will doubtless welcome the announcement of the manufacturers that this nail is to be sold only through regular trade channels.

Ever Ready Dry Battery.

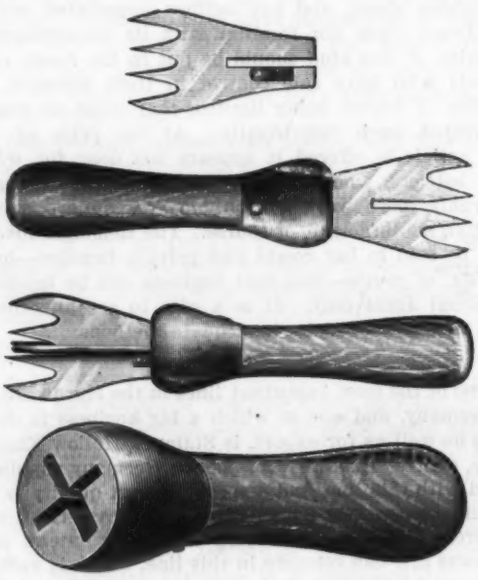
The American Electrical Novelty & Mfg. Company, Hudson and Spring streets, New York, have added to their already comprehensive line of electrical novelties the Ever Ready dry battery here illustrated. The outer dimensions of this battery are 2½ x 6 inches, and it is especially recommended by them for use in connection with gas and gasoline engines, motor cycles, automobiles and telephone work, as well as the multifarious purposes for which such a battery is suitable. The company in describing it say that it will give from 22 to 25 amperes, will show 1.6 voltage, has from 30 to 40 per cent. more recuperative power than has previously been obtainable, will last longer on the shelf and, most important of all, each cell will be found to run uniformly, so that when connected up for use in series each cell can be depended on for equal service. These batteries they offer

Ever Ready Dry Battery.

as a high grade article, using only the best ingredients, the cells of which they assert are composed of chemically pure zinc.

Wagner Mfg. Company's Ice Chippers.

The Wagner Mfg. Company, Cedar Falls, Iowa, are offering to the trade ice chippers, as shown herewith, with two blades at right angles, one of which may be removed if desired. This construction is stated to more than



Wagner Mfg. Company's Ice Chippers.

double the amount of ice that can be chipped in a given time with the ordinary flat chisel. One blade is securely fastened into a heavy iron socket head, a rivet holding it in place. The supplementary blade enters the heavy iron socket head at right angles, where it is held in place by the spring indicated.

Classic Food Chopper.

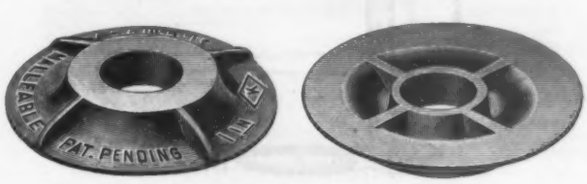
The Griswold Mfg. Company, Erie, Pa., are manufacturing the Classic food chopper here illustrated, which is made in Nos. 1, 2 and 3. It is designed for chopping all kinds of meats, vegetables and fruits. The No. 1, or smallest size, has a diameter of hopper 3 x 2½ inches and diameter of barrel of 2 inches. Four cutters are supplied for coarse, medium and fine chopping, and one for grinding nut butter. It weighs 4½ pounds, and has a capacity of 2 pounds of meat a minute. A special feature is the drip spout for carrying juices of any kind forward into

Classic Food Chopper.

the receiving dish, which would otherwise leak out at crank end. There is also an improved table clamp with large flat plate to insure a firm grip on under side of table without marring it. The knives have beveled faces to give a sharp, clean cut. The table clamp screw and knife thumb screws are made of steel to obviate loss by breakage. The No. 2 has a capacity of 2½ pounds meat per minute and weighs 5 pounds; the No. 3, weighing 9 pounds, and being designed for clubs, hotels, restaurants, &c.

Malleable Iron Washers.

St. Louis Malleable Casting Company, 7800 North Broadway, St. Louis, Mo., are manufacturing the malleable iron washers (patent pending), as here illustrated. The features of this washer, as emphasized by the company, are, weight one-third of and strength 400 per cent. greater than cast iron washers, and at the same time as cheap as the latter. The illustrations show top and bottom views. They are made in standard diameters, same as cast washers, with a thickness of about one-half, saving, it is said, about 66 2-3 per cent. weight to structure and from ½ to 1 inch in length of bolts, together with 66 2-3 per cent. in freight rates. Other characteristics are no loss in breakage, and clean, smooth and perfect castings. They are regularly made for bolts ½ to 2 inches in diameter, special sizes and shapes being made to order.



Malleable Iron Washers.

Fifer & Beatty have purchased the stock, fixtures and good will of the Hardware business lately conducted by H. L. Magee & Co., Limited, corner of Front and Lehigh avenue, Philadelphia, and will continue at the old stand.

Reliable Store Ladders.

Allith Mfg. Company, Chicago, Ill., are putting on the market the store ladders represented in the accompanying illustrations. Fig. 1 shows their Reliable store base shelf ladder, the fixtures of which are made of malleable iron, with double rollers, which, it is stated, prevent the ladder being derailed. All the wheels are roller bearing and

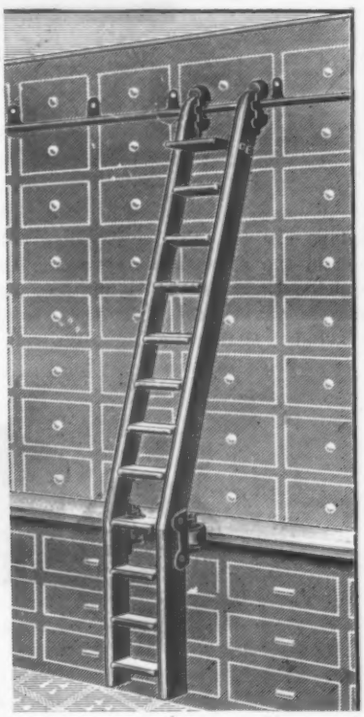


Fig. 1.—Reliable Store Base Shelf Ladder.

with fiber tread, reducing friction and noise to a minimum. The track is the company's No. 2, with malleable iron supports. The ladders are referred to as made from the best kiln dried, thoroughly seasoned lumber, hard pine or oak, and as highly finished, being well rubbed, filled and varnished.

Fig. 2 shows the company's Reliable store overhead ladder. The fixtures are of malleable iron. The ladder is self adjusting, with four roller bearing, fiber tread

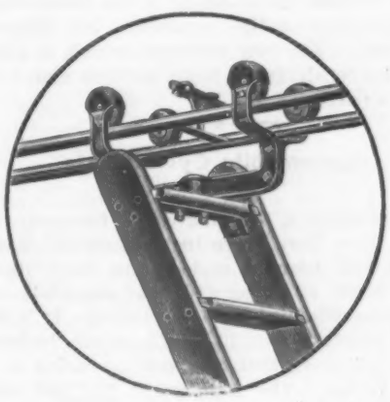
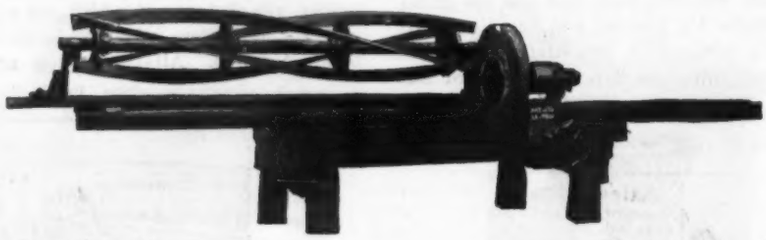


Fig. 2.—Reliable Store Overhead Ladder.

wheels, making it noiseless and easy running. The floor wheels are 3½ inches in diameter, roller bearing and rubber tired. The track is their No. 1 double tread, fitted with malleable iron ceiling brackets. The ladders are 12 inches wide and are made from the same high quality lumber, highly finished, as the base shelf ladder above described.

Power Bench Lawn Mower Grinder.

George Ricardo, 195 Water street, New York, has just put on the market a power bench lawn mower grinder for grinding or regrinding the revolving cutters or wipers of lawn mowers, as here illustrated. It consists of a machined bed plate 6 feet 4 inches long by 3 inches in width, on which moves back and forth a carriage 4 feet long, for mounting on a bench 3½ to 4 feet in length. On the carriage are two V's or supports bolted to the carriage to hold the axle of the revolving cutter to be ground, a quick adjustment being obtained by loosening a nut and accommodating the wiper shaft to any desired length, the grinder sharpening equally well an 8-inch size hand mower or 40-inch horse-power lawn mower, as well as all intermediate sizes. The grinding mechanism consists of an emery wheel 1 x 10 inches mounted on a shaft carrying a 3-inch pulley, the emery wheel being intended to run 2100 revolutions a minute. The emery wheel is fed to the work by a hand screw, so that the carriage with the revolving cutters or wiper is never out of line. A gauge directly in front of the emery wheel causes the curved blade to move upward as the operator pushes the carriage along the surface of the emery wheel, which, turning in the opposite direction, grinds a perfectly true bevel on that particular blade. To economize time the operator can go over the same surface again in the reverse direction as the carriage is pulled backward to repeat the process, the grinding of the remaining blades being a repetition of the operation. Mr. Ricardo uses this machine in his own business, which is almost exclusively the repairing of lawn mowers and furnishing of duplicate parts.



Power Bench Lawn Mower Grinder.

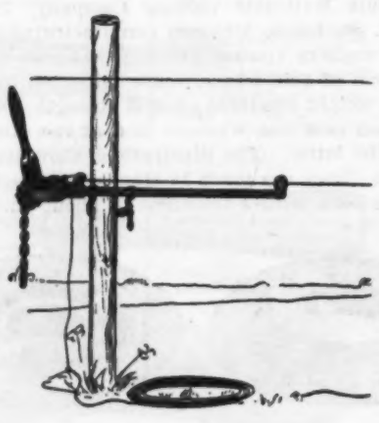
Automobile Cycle Skate.

The Cycle Skate & Sporting Goods Company, 123 Liberty street, New York, have just put on the market the automobile ball bearing cycle skate, here illustrated. It is finely made of strong and light materials, many of the parts being stamped from sheet steel. It is adjusted to various lengths from 10 to 12 inches, inclusive, its length over all being that of many ice racing or hockey skates—18 inches. The adjustment for foot length is obtained by telescoping a ½-inch tube in a ⅝-inch tube and holding it rigidly with a filister head screw underneath, various parts of the tubing being reinforced where extra strains occur to give a homogeneous strength. An important feature of this construction is the make-up of the wheels, which have well made solid rubber tires, with inner lugs through which pass the four screws with hexagon nuts to clamp the two flanged centers carrying the ball bearing cups and cones, in which are used high grade steel balls. The rubber tires, which would keep their position if the lugs were removed, are ⅝ x 4 inches outside diameter, and made by one of the best known rubber companies. The low meta-centric hight of the tubing and the russet leather strap are marked advantages for both comfort and safety in the use of the skate, which can be used equally well for sidewalk, asphalt or rink skating and touring along country roads. The company expect in the near future to produce a similar skate with 5-inch wheels and five lugs. The company state that a record of a mile in 2 minutes and 50 seconds has been made with the skate now on the market. All the metal parts are polished and nickel plated. The company also make a similar skate for boys and girls, with flat steel extension plate quickly adjustable to different sized feet, which is comparatively new, but which with rigid foot plate has been on the market for some time.

Automobile Cycle Skate.

Moyer's Wire Stretcher.

Wood Brothers Steel Self Feeder Company, Des Moines, Iowa, are placing on the market Moyer's wire stretcher, as shown herewith. The stretcher pulls the wire about 10 inches past the post, obviating the pressence of loose wire after removing the stretcher. It has great leverage, and is stated to be adapted either to woven wire or barbed wire fence, and is said to be peculiarly adapted to splicing broken wire. With this machine, it is pointed out, it is not necessary to sink a supplementary post in turning a corner, as it stretches the wire against the post to which it is fastened.



Moyer's Wire Stretcher.

Current Hardware Prices.

REVISED MARCH 29, 1904

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓@33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued June, 1903, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Abrasives—

Adamite in Carloads:
Crystal ... ℔ ton $90@100
Grain ... ℔ ton $120@140
See also *Emery*.

Adjusters, Blind—

Domestic, ℔ doz. $3.00 ... 33⅓&5%
North's ... 10%
Zimmerman's—See *Fasteners, Blind.*

Window Stop—

Ives' Patent ... 35%
Taplin's Perfection ... 35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Arm and Hammer, Wrought ℔ lb 8¼@8¾¢
Buel Patent Trenton ... ℔ lb 9½@10¢
Eagle Anvils ... ℔ lb 7¼@7¾¢
Hay-Budden, Wrought ... 9@9¼¢
Horseshoe brand, Wrought ... 9@9¼¢

Imported—

Peter Wright & Sons ... ℔ lb 10½¢

Anvil, Vise and Drill—

Millers Falls Co., $18.00 ... 15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Hull Bros. Co ... 30&5%

Augers and Bits—

Com. Double Spur ... 70&10@75%
Boring Machine Augers ... 66⅔@70%
Car Bits, 12-in. twist ... 60@60&10%
Jennings' Pattern ... 50&10&5@60%
Ford's Auger and Car Bits ... 40&5%
Forstner Pat. Auger Bits ... 25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list 25&10%
No. 30. R. Jennings' List. 40&7½&10%
Russell Jennings' ... 25&10&2½%
L'Hommedieu Car Bits ... 15&10%
Mayhew's Countersink Bits ... 45%
Millers' Falls ... 50&10&7½%
Pugh's Black ... 30%
Pugh's Jennings' Pattern ... 35%
Snell's Auger Bits ... 60%
Snell's Bell Hangers' Bits ... 50&10%
Snell's Car Bits, 12-in. twist ... 60%
Wright's Jennings Bits (R. Jennings' list) ... 50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Clark's small, $15; large, $26 ... 50&10%
Clark's Pattern, No. 1, ℔ doz., $26; No. 2, $18 ... 50&10%
Ford's, Clark's Pattern ... 50&10&6%
C. E. Jennings & Co., Steer's Pat. 25&10%
Swan's ... 60%

Gimlet Bits—

Common Double Cut, gro. $3.00@3.25
German Pattern ... gro. $4.50@4.75

Hollow Augers—

Bonney Pattern, per doz. $10.00@11.00
Ames ... 25&10%
New Patent ... 25&10%
Universal ... 30%
Wood's Universal ... 25%

Ship Augers and Bits—

Ford's ... 40%
Snell's ... 40%
C. E. Jennings & Co.:
L'Hommedieu's ... 15&10%
Watrous' ... 33⅓&10%

Awl Hafts, See *Hafts, Awl.*

Awls—

Brad Awls:
Handled ... gro. $2.75@3.00
Unhandled, Shouldered. gro. 63@66c
Unhandled, Patent ... gro. 66@70c
Peg Awls:
Unhandled, Patent ... gro. 31@34c
Unhandled, Shouldered. gro. 65@70c
Scratch Awls:
Handled, Common .. gro. $3.50@4.00
Handled, Socket .. gro. $11.50@12.00
Hurwood ... 40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

First Quality ... $5.50@6.00
Second Quality ... $4.75@5.25

Axle Grease—See *Grease, Axle*

Axles— *Iron or Steel*

Concord, Loose Collar ... 5@5½c
Concord, Solid Collar ... 5@5½c
No. 1 Common ... 4@4½c
No. 1½ Com. New Style ... 4½@5c
No. 2 Solid Collar ... 4¾@5¼c
Nos. 7, 8, 11 and 12 ... 60&5@60&10%
Nos. 13 to 14 ... 60@5@60&10%
Nos. 15 to 18 ... 60&10@70%
Nos. 19 to 22 ... 60&10@70%

Boxes, Axle—

Common and Concord, not turned ..
lb. 4¼@4½c
Common and Concord, turned ..
lb. 5@5½c
Half Patent ... lb. 9@9½c

Bait— Fishing—

Heudryx:
A Bait ... 20%
B Bait ... 25%
Competitor Bait ... 20&5%

Balances— Sash—

Caldwell new list ... 50%
Pullman's ... 60%

Spring—

Spring Balances ... 60@60&5%
Chatillon's:
Light Spg. Balances. ... 40&10%
Straight Balances. ... 40%
Circular Balances ... 50%
Large Dial ... 30%
Pelouze ... 50%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb., per lb.. 3@3½c

Towel—

No. 10 Ideal, Nickel Plate ... ℔ gro, $8.50

Beams, Scale—

Scale Beams, List Jan. 12, '82. 40&10%
Chattillon's No. 1 ... 30%
Chattillon's No. 2 ... 40%

Beaters— Egg—

Holt-Lyon Co.:
Holt, No. A, Japanned ... ℔ doz. $1.20
Holt, No 1, Tinned ... ℔ doz. $1.50
Holt, No. B, Japanned ... ℔ doz. $2.00
Holt, No. 2, Tinned ... ℔ doz. $2.25
Lyon, No. 2, Japanned ... ℔ doz. $1.25
Lyon, No. 3, Japanned ... ℔ doz. $1.50
Lightning Chain, ℔ gro ... $15.00
National Mfg. Co.: ℔ gro.
No. 1 Dover, Family size ... $7.00
No. 2 Dover, Hotel size ... 14.00
Taplin Mfg. Co.: ℔ gro.
No. 60 Improved Dover ... $6.00
No. 75 Improved Dover ... $6.50
No. 100 Improved Dover ... $7.00
No. 102 Improved Dover, Tin'd ... $8.50
No. 150 Improved Dover, Hotel ... $15.00
No. 152 Imp'd Dover, Hotel, T'd ... $17.00
No. 200 Imp'd Dover Tumbler ... $8.50
No. 202, Imp'd Dover Tumbler, Tin'd. $9.50
No. 300, Imp'd Dover Mammoth, ℔ doz. ... $25.00
Western, W. G. Co., Buffalo ... $8.00
Wonder (S. S. & Co.) ... ℔ gro. net, $6.00

Bellows—

Blacksmith, Standard List .. 75@75&5%

Blacksmiths'—

Inch..	*30*	*32*	*34*	*36*	*38*	*40*
Each	*$3.50*	*3.75*	*4.25*	*4.80*	*5.35*	*6.15*

Extra Length:

Each	*$5.00*	*4.55*	*5.10*	*5.60*	*6.40*	*7.50*

Molders—

Inch		*10*	*12*	*14*
Doz		*$8.50*	*10.00*	*13.00*

Hand—

Inch	*6*	*7*	*8*	*9*	*10*
Doz	*$4.25*	*4.50*	*5.00*	*6.50*	*7.75*

Net Prices.

Bells— Cow—

Ordinary goods ... 75&5@75&10%
High grade ... 70&10@70&10&5%
Jersey ... 75&10%
Texas Star ... 50%

Door—

Abbe's Gong ... 45%
Barton Gong ... 55%
Home, R. & E. Mfg. Co.'s ... 55&10%
Lever and Pull, Sargent's ... 60&10&10%
Yankee Gong ... 30%

Hand—

Hand Bells, Polished, Brass ... 60& @60&10%
White Metal ... 60%
Nickel Plated ... 50@50&5%
Swiss ... 60@60&7½%
Cone's Globe Hand Bells ... 33⅓@33⅓&10%
Silver Chime ... 33⅓@33⅓&10%

Miscellaneous—

Farm Bells ... lb. 2@2¼
Steel Alloy Church and School .. ... 60@60&5%
American Tube & Stamp'g Co. Gongs .. 75%
Table Call Bells ... 50@50&10%
Trip Gong Bells ... 55&10@60%

Belting— Rubber—

Agricultural (Low Grade) .. 75@75&5%
Common Standard ... 70@70&10%
Standard ... 65@70%
Extra ... 60&5@60&10%
High Grade ... 59&5@50&10%
Boston Belting Co.:
Seamless Stitched Imperial ... 45&5%
Boston ... 50&5%
Niagara ... 60&5%

Leather—

Extra Heavy, Short Lap ... 60@60&5%
Regular Short Lap 60&10@60&10&10%
Standard ... 70@70&5%
Light Standard ... 70&10%
Cut Leather Lacing ... 60&10%
Leather Lacing Sides, per sq. ft .. 18c

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender ... 40%
Green River Tire Benders and Upsetters ... 30%
Detroit Steddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $30.50.

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain ... 50%
Parts ... 50%
Spokes ... 50%
Tubes ... 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—
See *Augers and Bits.*

Blocks— Tackle—

Common Wooden ... 70&10@75&5%
Hollow Steel Blocks, with Ford's Patent Sheaves ... 50&10%
Lane's Patent Automatic Lock and Junior ... 30%
Stowell's Novelty, Mal. Iron ... 50&10%
Stowell's Self Loading ... 60%
See also *Machines, Hoisting.*

Boards, Stove—

Zinc, Crystal, &c ... 30&10@40&10%

Bolts—

Carriage, Machine, &c.—

Common Carriage ... 70&10@75%
Phila. Eagle, $3.00 list May 24, '99 ... 80@80&5%
Bolt Ends, list Feb. 14, '95 ... 75&5%
Machine ... 75&5@75&10%
Machine with C & T. Nuts ... 70&10%

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:

Inch	*3*	*4*	*5*	*6*	*8*
Per doz	*$0.26*	*.30*	*.39*	*.47*	*.65*

Cast Iron Spring Foot:

Inch	*6*	*8*	*10*
Per doz	*$1.00*	*1.25*	*1.75*

Cast Iron Chain, Flat, Japanned:

Inch	*6*	*8*	*10*
Per doz	*$0.75*	*1.05*	*1.30*

Cast Iron Shutter, Brass Knobs:

Inch	*6*	*8*	*10*
Per doz	*$0.57*	*.80*	*1.00*

Wrt Barrel, Jap'd .75&10@75&10&10%
Wrought " Bronzed .40&5@50&10%
Wrought Flush, B. K. .50&10@60&10%
Wrought Shutter ... 40&10&10@60&5%
Wrought Square Neck ... 50@50&10%
Wrought Sunk, Flush ... 50@50&10%
Ives' Patent Door ... 60%

Stove and Plow—

Plow ... 60@60&5%
Stove ... 90&5@30&10&5%

Tire—

Common ... 72½@72½&10%
Norway Iron ... 80@80&5%
American Screw Company:
Norway Phila., list Oct. 16, '84 ... 80%
Eagle Phila. list Oct. 16, '84 ... 82½%
Bay State, list Dec. 28, '99 ... 72½%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84 ... 80%
Eagle Phila., list Oct. 16, '84 ... 83½%
Eclipse, list Dec. 28, '99 ... 72½%
Russell, Burdsall & Ward Bolt & Nut Co.
Empire, list Dec. 28, '99 ... 72½%
Norway Phila., list Oct. '84 ... 80%
Upson Nut Co.:
Tire Bolts ... 72½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch	*1¼*	*1½*	*1¾*	*2*
Per doz	*$4.30*	*5.00*	*5.75*	*7.25*
Inch			*2¼*	*2½*
Per Doz			*$8.65*	*11.50*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each ... 25%

Boxes, Mitre—

C. E. Jennings & Co ... 25&10%
Langdon ... 15&10%
Perfection ... ℔ doz. $36 00
Schatz ... 40%

Braces—

NOTE.—*Most Braces are sold at net prices.*
Common Ball, American .. $1.15@1.25
Barber's ... 50&10&10@60&10%
Fray's Genuine Spofford's ... 60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 ... 60%
C. E. Jennings & Co ... 50&5&10%
Mayhew's Ratchet ... 60%
Mayhew's Quick Action Hay Patent .. 50%
Millers Falls Drill Braces ... 25&10%
P. S. & W. Co. Peck's Patent 60&10@65%

Brackets—

Wrought Steel ... 80@80&10%
Bradley's Wire Shelf:
Full cases ... 80&10&10%
Broken cases ... 80&10%
Griffin's Pressed Steel ... 80%
Griffin's Folding Brackets ... 70&10%
Stowell's Cast Shelf ... 75%
Stowell's Sink ... 50%
Western, W. G. Co., Wire ... 60&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Western, W. G. Co ... 80%
Wire Goods Co ... 75@75&10%

Buckets, Well and Fire—See *Pails*

Bucks, Saw—

Hoosier ... ℔ gro. $36.00

Bull Rings—See *Rings, Bull.*

Butts— Brass—

Wrought list Sept., '96 ... 20@30%
Cast Brass, Tiebout's ... 50%

Cast Iron—

Fast Joint, Broad ... 50@50&10%
Fast Joint, Narrow .. ... 50@50&10%
Loose Joint ... 70&5@70&10%
Loose Pin ... 70&5@70&10%
Mayer's Hinges ... 70&5@70&10%
Parliament Butts ... 70&5@70&10%

Wrought Steel—

Table and Back Flaps ... 75%
Narrow and Broad ... 75%
Inside Blind ... 75&10%
Loose Pin ... 75%
Loose Pin, Ball and Steeple Tip 80&20%
Japanned, Ball Tip Butts. 70&10%
Bronzed Wrt. Nar. and Inside Blind Butts ... 55&10%

Extra 10@10&10%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series ... 5%
1200 series ... 33⅓%
200, 300, 600 and 900 series ... 40&10%
Hendryx Bronze:
700, 800 series ... 40&10%
Hendryx Enameled ... 40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong ... per lb. .4@4½c
Sharp, 1 prong ... per lb. 4½@4¾c
Perkins' Blunt Toe ... cents, ℔ lb .35
Perkins' Sharp Toe ... cents, ℔ lb .45

Can Openers—See *Openers, Can*

Cans, Milk—

	5	8	10 gal.	
Illinois Pattern.	$1 50	2.00	2.25	each.
Iowa Pattern...	....	2.35	2.50	each.
	20	30	40	qts.
New York Patt'rn	1.65	2.40	2.75	each.
Baltimore Patt'rn	....	1.80	2.00	each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.	
$48.00	64.20	129.00	gro., net

Caps—Percussion—

Eley's E. B. 60c
G. D.....per M 35@35c
F. L.....per M 40@45c
G. E.....per M 50@52c
Musket.....per M 62@62c

Primers—

Berdan Primers, $2.00 per M...20&5%
B. L Caps (Sturtevant Shells) $2.00 per M.....20%
All other primers per M.$1.52@$1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50.....10c&5%
38 C. F., $7.00.....10c&5%
22 cal. Rim, $1.50.....10c&5%
32 cal. Rim, $2.75.....10c&5%
B. B. Caps, Con. Ball Swgd.....$1.90
B. B. Caps, Round Ball.....$1.49
Central Fire.....35%
Target and Sporting Rifle.....15c&5%
Primed Shells and Bullets.....15c&10%
Rim Fire Sporting.....50%
Rim Fire, Military.....15c&5%

Cases, Show—

Sun, No. 102. Silent Salesman, 6 ft., $25.00

Casters—

Bed.....70@70c&10%
Plate.....60c&5@60c&10%
Philadelphia.....75@75c&5%
Boss.....70&10%
Boss Anti-Friction.....70&10%
Gem (Roller Bearing).....75&10%
Martin's Patent (Phœnix).....45%
Smith & Hemenway Co.....33⅓&
Standard Ball Bearing.....45%
Tucker's Patent low list.....30%
Yale (Double Wheel) low list.....45%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Coil—

American Coil, Jobbers' Shipments:

3-16	¼	5-16	⅜	7-16	½	9-16
8.00	5.50	4.15	3.75	3.60	3.50	3.45
⅝	¾	⅞	1 to 1¼ inch.			
3.3)	3.25	3.50	3.15	per 100 lb.		

German Coil.....60&10c&10%

Halters and Ties—

Halter Chains.....60c&10@60c&10c&10%
German Pattern Halter Chains, list July 24, '97.....60c&10&10@70c&10%
Cow Ties.....60@60c&10%

Trace, Wagon, &c.—

Traces, Western Standard: 100 pair
6½—6-3, Straight, with ring...$24.00
6½—6-2, Straight, with ring..$24.50
6½—8-2, Straight, with ring..$28.00
6½—10-2, Straight, with ring..$33.00
Add 2c per pair for Hooks.
Twist Traces 2c per pair higher than Straight Link.
Trace, Wagon and Fancy Chains..60c&5@60c&10c&5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60c&10@60c&10c&10%
Brass.....60c&10@60c&10c&10%
Safety Chain.....70c&10@75c&5%
Gal. Pump Chain.....lb 4¼@4¾c
Covert Mfg. Co.
Breast.....40&2%
Halter.....40&2%
Heel.....40&2%
Rein.....40&2%
Stallion.....40&2%
Covert Sad. Works:
Breast.....70%
Halter.....70%
Hold Back.....70%
Rein.....70%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Eureka Coil and Halter.....45@50&5%
Niagara Coil and Halters....45@50&5%
Niagara Cow Ties.....45&5@50&10&5%
Niagara Wire Dog Chains...45@50&5%
Wire Goods Co.:
Dog Chain.....70&10%
Universal Dbl-Jointed Chain.....50%

Chalk—(From Jobbers.)

Carpenters' Blue.....gro. 40c
Carpenters', Red.....gro. 35c
Carpenters', White.....gro. 30c
See also Crayons.

Checks, Door—

Bardsley's.....45%
Columbia.....50&10%
Eclipse.....60&10%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemens' Chests, with Tools.....30%
Farmers', Carpenters', etc., Chests, with Tools.....30%
Machinists' and Pipe Fitters' Chests, Empty.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....33⅓&10%

Chisels—

Socket Framing and Firmer

Standard List.....70@70c&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Socket Firmer No. 10.....60&10%
C. E. Jennings & Co. Socket Framing No. 15.....60&10%
Swan's.....70%
L. & I. J. White.....30@30&5%

Tanged—

Tanged Firmers.....50c&5@50&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Nos. 191, 181.....16⅔&10%
L. & I. J. White, Tanged.....20&10%

Cold—

Cold Chisels, good quality.lb. 13@15c
Cold Chisels, fair quality..lb. 11@12c
Cold Chisels, ordinary.....*lb. 9 @10c*

Chucks—

Beach Pat., each $8.00.....35&5%
Pratt's Positive Drive.....25%
Empire.....25%
Blacksmiths'.....25%
Skinner Patent Chucks:
Combination Lathe Chucks.....40%
Drill Chucks, Patent and Standard...30%
Drill Chucks, New Model.....30%
Independent Lathe Chucks.....40%
Improved Planer Chucks.....25%
Universal Lathe Chucks.....40%
Face Plate Jaws.....40%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination.....50%
Czar Drill.....35%
Combination Geared Scroll.....40%
Geared Scroll.....40%
Independent.....50%
Independent Steel.....40%
Union Drill.....45%
Universal.....50%
Independent Iron Face Plate Jaws..40%
Independent Steel Face Plate Jaws..40%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....45%
Little Giant Double Grip Drill.....45%
Little Giant Drill, Improved.....45%
Oneida Drill.....45%
Scroll Combination Lathe.....45%

Clamps—

Adjustable, Hammers'.....30@20&5%
Cabinet, Sargent's.....50&10%
Carriage Makers', P., S. & W. Co......50%
Carriage Makers' Sargent's.....60%
Besly, Parallel.....33⅓&10%
Linemans' Utica Drop Forge & Tool Co40%
Saw Clamps, see *Vises, Saw Filers'.*

Cleaners, Drain—

Iwan's Champion, Adjustable.....35%
Iwan's Champion, Stationary.....40%

Sidewalk—

Star Socket, All Steel.....₱ doz. $4.05 net
Star Shank, All Steel.....₱ doz. $3.24 net
W. & C. Shank, All steel, ₱ doz., 7⅞ in., $3.00; 8 in., $3.35.

Cleavers, Butchers'—

Foster Bros......30%
New Haven Edge Tool Co.'s.....45%
Fayette R. Plumb.....33⅓&33⅓&10%
L. & I. J. White.....30%

Clippers—

Chicago Flexible Shaft Company:
'98 Chicago Horse.....$8.75 } 15%
1902 Chicago Horse.....$10.75 }
20th Century Horse, each, $5.00.....20%
Lightning Belt.....$15.00 }
Chicago Belt.....$20.00 } 15%
Stewart's Patent Sheep.....$18.50 }

Finger Nail Clippers—

Smith & Hemenway Co.....doz. net $2.00

Clips, Axle—

Eagle and Superior ¼ and 5-16 inch.....70c&10%
Norway, ¼ and 5-16 inch..70@70c&10%

Cloth and Netting, Wire —See *Wire, &c.*

Cocks, Brass—

Hardware list:
Compression and Plain Bibbs.....65c&10@70%
Globe, Kerosene, Racking, &c., Cocks.....65c&5@70c&5%

Coffee Mills—See *Mills, Coffee.*

Collars, Dog—

Brass, Walter B. Stevens & Son's list.40%
Embossed, Gilt, Walter B. Stevens & Son's list.....30&10%
Leather, Walter B. Stevens & Son's list40%

Combs, Curry—

Metal Stamping Co.....30&10%

Mane and Tail—

Covert's Saddlery Works.....60&10%

Compasses, Dividers, &c.

Ordinary Goods.....75c&5@75c&10%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....50%
Compasses.....50%

Compressors, Corn Shock—

J. B. Hughes' ₱ doz.....$2.50

Conductor Pipe, Galva.—

L. C. L. to Dealers:

Territory.	*Nested.*	*Not nested.*
A. Eastern.	75c&7½%	75c&2½%
B. Eastern.	75c&10&2½%	75c&7½%
Central.....	75c&7½%	75%
Southern ..	70c&10%	70c&5%
S. Western..	70c&7½%	70c&2½%

Terms, 60 days, 2% cash, 10 days. Factory shipments generally delivered.
See also *Eave Troughs.*

Coolers, Water—

Gal. each.	½	3	4	6	8
Labrador	$1.20	$1.50	$1.80	$2.10	2.70
Gal.	3	4	6	8	
Iceland, ea.	$1.80	$2.10	2.40	$3.00	
Gal.	2	3	4	6	8
Galv. Lined Ea.	$1.25	$2.00	$2.2	$2.90	$3.90

25%

Ga.v. Lined side handles

Gal.	2	3	4	6	8
Each.	$1.95	$2.15	$2.40	$3.30	$4.15..25%

Coopers' Tools—

See *Tools, Coopers'.*

Cord—Sash—

Braided, Drab.....lb. 35c
Braided, White, Com.....lb. 25@25c
Cable Laid Italian..lb. A, 18c; B, 16c
Common India.....lb. 10@10½c
Cotton Sash Cord, Twisted....20@25c
Patent Russia.....lb. ..@11c
Cable Laid Russia.....lb. ..@15c
India Hemp, Braided.....lb ..@18c
India Hemp, Twisted.....lb. 12@13c
Patent India, Twisted.....lb.12@13c
Anniston Cordage Co.: Braided Cotton.
Old Glory, Nos. 7 to 12.....₱ lb 30 ¢
Anniston, Nos. 7 to 12.....₱ lb 25 ¢
Old Colony, Nos. 7 to 12.....₱ lb 25 ¢
Anniston Drab, Nos. 7 to 12...₱ lb 30 ¢
Pearl Braided, cotton, No. 6₱ lb, 24¢; Nos. 7 to 12 25¢.
Eddystone Braided Cotton, No. 6 ₱ lb 27¢
Harmony Cable Laid Italian. No. 7 to 16.....₱ lb 33¢
Peerless:
Cable Laid Italian.....16¢
Cable Laid Russian.....14¢
Cable Laid India.....12¢
Braided India.....18¢
Samson, Nos. 7 to 12:
Braided, Drab Cotton.....₱ lb 36½¢
Braided, Italian Hemp.....₱ lb 36¢
Braided, Linen.....₱ lb 53¢
Braided, White Cotton or Spot.₱ lb 33¢
Massachusetts, White.....₱ lb 28 ¢
Massachusetts, Drab.....₱ lb 32 ¢
Phœnix, White, No's 7 to 12.....24¢
No. 6 cords, 1¢ extra.
Silver Lake:
A quality, Drab.....40¢
A quality, White.....35¢
B quality, Drab.....35¢
B quality, White.....30¢
Italian Hemp.....40¢
Linen.....57½¢

Wire, Picture—

List Oct.,'00.....85c&10@85c&10c&10c&5%

Cradles—

Grain.....40c&12½%

Crayons—

White Round Crayons, gross.5½@6c
Cases, 100 gro., $4.00, at factory.
D. M. Steward Mfg. Co.
Jumbo Crayons.....gr. $3.50
Metal Workers' Crayons.gr. $2.50
Soapstone Pencils, round, flat or square.....gr.$1.50
Rolling Mill Crayons.....gr. $2.50
Railroad Crayons (composition) gr. $2.00
Case lots 30%
Zelnicker's Lumber:
Red, Blue, Green.....₱ gro. $6.50
Black.....₱ gro. $4.00
See also *Chalk.*

Crooks, Shepherds'—

Fort Madison, Heavy.....₱ doz. $7.00
Fort Madison, Light.....₱ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 Medium Knives, 1847..₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....₱ doz. $3.00
Wm. Rogers & Son.....₱ doz. $2 50
Simeon L. & Geo. H. Rogers Company:
12 dwt. Medium Knives.....₱ doz. $3.00
No. 77 Medium Knives.....₱ doz. $2.50

Cutters—Glass—

H. H. Mayhew Co.....40%
Red Devil.....50%
Smith & Hemenway Co.....50%
Woodward.....40%

Meat and Food—

American.....30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Enterprise.....25@25&7½%

Nos.	5	10	12	22	32
Each	$2	$3	$3.75	$4.50	$6

Dixon's, ₱ doz.....30&10&40%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal.....40&10&50%
Little Giant, ₱ doz.....33⅓&40%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers.....40%
New Triumph No. 605, ₱ doz. $24.00.....30&10@40%
Russwin Food No. 1, $24 00; No. 2, $27.00.....45&10&10%
Sterling.....40@40&10%
No 1....$3.00 each No. 2..$2.50 each
Woodruff's, ₱ doz.....30&10@40%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers.....35@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters 24 x 7, 26 x 8, 30 x 9.55%
Kraut Cutters 36 x 12, 40 x 12.....40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife.....₱ doz. $3.00
Combined Slaw Cutter and Corn Grater.....₱ doz. $4.00
Sterling $6.00 each.....33⅓&
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife, ₱ gr....$18@$20
Slaw Cutters, 2 Knife, ₱ gr....$32@$36

Tobacco—

All Iron, Cheap.....doz. $4.25@$4.50
Enterprise.....25&10%
National, ₱ doz. No. 1, $21. No. 2, $18..40%
Sargent's, ₱ doz., No. 2.....60%
Sargent's No 12 and 21.....60&10%

Washer—

Appleton's, ₱ doz. $16.00.....50&10&10%
Bonney's.....33⅓&

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger...per doz., $9.00
Iwan's Improved Post Hole Auger.40&5%
Iwan's Vaughan Pattern Post Hole Augers, ₱ doz.....$6.50
Iwan's Perfection Post Hole Digger..₱ doz. $8.50
Iwan's Split Handle Post Hole Diggers, ₱ doz.....$7.50
Kohler's Universal.....₱ doz. $15.00
Kohler's Little Giant.....₱ doz. $12.60
Kohler's Hercules.....₱ doz. $10.00
Kohler's Invincible.....₱ doz. $9 60
Kohler's Rival.....₱ doz. $8.50
Kohler's Pioneer.....₱ doz. $7.50
Never-Break Post Hole Diggers, ₱ doz. $24.00.....60%
Samson, ₱ doz. $34.00.....25%

Dividers—See *Compasses.*

Doors Screen—

Phillips', style E, ¼ in.....₱ doz, $10.50
Phillips', style 077, ¾ in.....₱ doz, $8.00
Phillips', style x-y, ¾ in.....₱ doz, $11.00
Porter's Plain, No. 6.....₱ doz. $6 75
Porter's Ornamental, No. 70. ₱ doz. $10.50
Porter's No. 99.....$9.00
Porter's No. 44.....$10.75

Drawers, Money—

Sun Money Drawers, No. 5, ₱ doz. $9.50; No. 8, with Bell, $10.00; No. 6, with Gong, $10.50.
Tucker's Pat. Alarm Till No. 1, ₱ doz. $18; No. 2, $15; No. 3, $12; No. 4, $18

Drawing Knives—

See *Knives, Drawing.*

Drills and Drill Stocks—

Common Blacksmiths' Drill..each $1.50@$1.75
Breast, Millers Falls.....15&10%
Breast, P., S. & W.....40&5%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills Nos. 2 and 3.....16⅔&10%
Johnson's Drill Points.....16⅔&5&10%
Millers Falls Automatic Drills...33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....33⅓%
Ratchet, Whitney's, P. S. & W.....50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....65c&10@60c&10c&10%
Taper and Straight Shank.....60c&10@60c&10c&5%

Drivers, Screw—

Screw Driver Bits..per doz. ..45@75c
Balsey's Screw Holder and Driver, ₱ doz. 2½-inch, $6; 4-in., $7.50 6-in., $9..40%
Buck Bros' Screw Driver Bits.....30%
Champion.....50%
Edson.....60%
Fray's Hol. H'dle Sets, No. 3, $12.00 50%
Gay's Double Action Ratchet.....35%
Goodell's Auto50&10&10@50&10&10&5%
Hurwood.....40%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40&10%
Millers Falls, Nos. 20 and 21.....25&10%
Millers Falls, Nos. 11, 12, 41 42.....15&10%
Never Turn.....60%
New England Specialty Co.....50%
Sargent & Co.'s:
Nos. 1 and 60.....50&10&10%
Nos. 50 and 55.....60&10%
Nos. 20 and 40.....70&10%
Smith & Hemenway Co.....40&5%
H. D. Smith & Co.'s, Perfect Handle..40%
Stanley R. & L. Co.'s:
No. 64, Varnished Handles.....60&10&10%
No. 86.....70@70&10&10%
Swan's:
Nos. 65 to 68.....50%
No. 40.....40&10%
Nos. 25, 35 and 45.....20&10&10%

Eave Trough, Galvanized

Territory.	*L. C. L.*
A. Eastern.....	*80c&10%*
B. Eastern.....	*80c&10c&5%*
Central.....	*80c&10%*
Southern.....	*75c&16⅔&*
S. Western..	*75c&10c&5%*

Terms, 2% for cash. Factory shipments generally delivered.
See also *Conductor Pipe and Elbows.*

Elbows and Shoes—

Factory shipments.....60%
Perfect Elbows (s. S. & Co.).....30%

Emery, Turkish—

	4to6	5&10	to150	Flour
Kegs.....	*lb. 5c*	*5½c*		*3½c*
¼ Kegs.....	*lb. 5½c*	*5¾c*		*3¾c*
Kegs.....	*lb 5c*	*6c*		
10-lb cans.10 in case.6½c		*7c*		*8c*
10-lb.cans,less than10.10c		*10c*		*8c*

NOTE.—*In lots 1 o 3 tons a discount of 10% is given.*

Extractors, Lemon Juice —See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's.....50&10%
Walling's.....50%

Cord and Weight—

Ives.....40%

Faucets—

Cork Lined.....50@50c&10%
*Metallic K-g, Leather Lind*70@70c&10%
Red Cedar.....40@40c&10%
Petroleum.....70c&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star.....60%
West Lock.....50&10%
John Sommer's Peerless Tin Key.... 40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Metal Key.50&10%
John Sommer's Duplex Metal Key....60%
John Sommer's Diamond Lock.....40%
John Sommer's I. X. L. Cork Lined...50%
John Sommer's Reliable Cork Lined 50&10%
John Sommer's Chicago Cork Lined..60%
John Sommer's O. K. Cork Lined.....50%
John Sommer's No Brand, Cedar.....50%
John Sommer's Perfection Cedar....40%
McKenna, Brass:
Burglar Proof, N. P.....35%
Improved, ¼ and ⅜ inch.....35%
Self Measuring:
Enterprise, ₱ doz. $60.00.....40&10%
Lane's, ₱ doz. $36.00.....40&10%
National Measuring, ₱ doz. $36..40&10%

Felloe Plates—

See *Plates, Felloe.*

Files—Domestic—

List revised Nov. 1, 1899.

Best Brands.....	*70c&5@70c&10c&5%*
Standard Brands.	*75c&5@75c&10c&10%*
Second Quality.....	*75c&10c&10@80c&5%*

Imported—

Stubs' Tapers, Stubs' list, July 2½, '97.....30%

Fixtures, Grindstone—

Net Prices:

Inch....	*15*	*17*	*19*	*21*	*24*
Per doz.	*$2.75*	*3.25*	*3.25*	*3.75*	*4.50*

P., S. & W. Co.....30&10@40%
Reading Hardware Co.....60%
Sargent's.....60&10&10%
Stowell's Giant Grindstone Hanger.... ₱ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy.....50&10&10%
Stowell's Grindstone Fixtures Light.... 60&10%

Fodder Squeezers—

See *Compressors.*

Forks—

Base Discounts Aug. 1, 1899, list:
Hay, 2 tine .50&10&5%
Boys', & Fish, 2 tine .50&10&5%
Hay & Boys', 3 tine 60&5%
Hay & Boys', 4 tine 60&5%
Champion Hay 60&10%
Hay & Header, long 3 tine .6 .%
Header, 4 tine 65%
Barley, 4 & 5 tine, Steel 60&10%
Manure, 4 tine .60&15&2½%
Manure, 5 and 6 tine 60&5&2½%
Spading 70&2½%
Potato Digger, 6 tine 60&10%
Sugar Beet 50&10%
Coke & Coal 40&10%
Hoavy Mill & Street 65%
Iowa Dig-Eay Potato 65%
Victor, Hay 60%
Victor, Manure 60%
Victor, Header 60%
Champion, Hay 60%
Champion, Manure 60&20%
Columbia, Hay 60%&5%
Columbia, Manure 70%
Columbia, Spading 70&10%
Hawkeye Wood Barley 4 tine ₱ doz. $5.00; 6 tine, $6.00.
W. & C. Potato Digger 60&12½%
Acme Hay 60&10&5%
Acme Manure, 4 tine 60&20&7½%
Dakota Header 65&15&5%
Jackson Steel Barley 65&15&5%
Kansas Header 60%
W. & C. Favorite Wood Barley 4 tine, ₱ doz., $5.00; 6 tine, $6.00
Plated.—See *Spoons.*

Fountains, Stock—

Double Dewey ₱ doz. $13.00

Frames— Saw—

White, Straight Bar, per doz. 75@80c
Red, Straight Bar, per doz $1.00@$1.25
Red, Double Brace, per doz. $1.40@1.50

Freezers Ice Cream—
Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp $2.75
Cotton 3.20
Waterproof Single Taped 3.65
Waterproof Double Taped 4.40
Waterproof Triple Taped 5.15
} 10&2½%

Gates, Molasses and Oil—

Stebbins' Pattern .30&5@80&10&5%

Gauges—

Marking, Mortise, &c. 50&10&5@5&10&10&5%
Chapin-Stephens Co.:
Marking, Mortise, etc. 50&10@50&10&10%
Scholl's Patent 50&10@50&10&10%
Door Hangers 50@50&10%
Fulton's Butt Gauge 30&10%
Stanley R. & L. Co.'s Butt & Babbet Gauge 20@20&10&10%
Wire, Brown & Sharpe's 25%
Wire, Morse's 25%
Wire P., S. & W. Co 30&10%

Gimlets— Single Cut—

Nail, Metal, Assorted, gro. $1.40@1.50
Spike, Metal, Assorted gro. $2.30@3.50
Nail, Wood Handled, Assorted, gro. $1.75@2.00
Spike, Wood Handled, Assorted gro. $4.25@4.50

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co 60@60&10&10%

Glue—Liquid Fish—

Bottles or Cans, with Brush .25@50%
Cans (½ pts., pts., qts., ½ gal., gal.) 25@48%
International Glue Co. (Martin's) 40&10@50%

Grease, Axle—

Common Grade, gro. $4.50@5.50
Dixon's Everlasting, 10-₱ pails, ea. 85₱
Dixon's Everlasting, in bxs., ₱ doz. 1 ₱ $1.20; 2 ₱ $2.00

Grips, Nipple—

Perfect Nipple Grips .40&10&2%

Griddles, Soapstone—

Pike Mfg. Co. 33⅓&33⅓&10%

Grindstones—

Bicycle Emery Grinder $6.50
Bicycle Grindstones, each $2.50@3.00
Pike Mfg. Co:
Improved Family Grindstones, per inch, per doz. $2.00
Pike Mower Knife and Tool Grinder, each $6.00
} 33⅓%
Velox Ball Bearing, mounted, Angle Iron Frames, each, $3.25

Halters and Ties—

Covert Mfg. Co.:
Web 45&2%
Jute Rope 40&5&5%
Sisal Rope 30&5%
Covert's Saddlery Works:
Web and Leather Halters 70%
Jute and Manila Rope Halters 70%
Sisal Rope Halters 60&20%
Jute, Manila and Cotton Rope Ties 70%
Sisal Rope Ties 60&10%

Hammers—
Handled Hammers—

Heller's Machinists' 40&10@40&10&10%
Heller's Farriers 40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75 40@40& 0&10%
Peck, Stow & Wilcox 40&10&5%
Fayette R. Plumb:
Plumb, A. E. Nail, 13¼&7½@33⅓&10&7½%
Engineers' and B. S. Hand 50&7½&5@50&10&7½&5%
Machinists' Hammers 50&5@50&10&5%
Riveting and Tinners' 40&2½@40&10&2½%
Sargent's C. S. New List 40%

Heavy Hammers and Sledges—

Under 3 lb. *lb 6c*
3 to 5 lb. *lb 4c*
Over 5 lb. *lb. 3c*
} 80@80&10%
Wilkinson's Smiths' 9½c@10c lb.

Handles—
Agricultural Tool Handles—

Axe, Pick, &c. 4@50&5%
Hoe, Rake, &c. 45@50&5%
Fork, Shovel, Spade, &c.:
Long Handles 45@50&5%
D Handles 40%

Cross-Cut Saw Handles—

Atkins' 40&5%
Champion 45@45&10%
Disston's 50%

Mechanics' Tool Handles—

Auger, assorted gro. $2.50@$2.85
Brad Awl gro. $1.65@$1
Chisel Handles:
Apple Tanged Firmer, gro. ass'd, $2.10@$2.65
Hickory Tanged Firmer, gro. ass'd. $2.15@$2.50
Apple Socket Firmer, gro. ass'd, $1.75@$1.95
Hickory Socket Firmer, gro. ass'd. $1.45 @ $1.60
Hickory Socket Framing, gro. ass'd. $1.60@$1.75
File, assorted gro. $1.30@$1.40
Hammer, Hatchet, Axe, &c. 50%
Hand Saw, Varnished, doz. .80@85c
Not Varnished .65@75c
Plane Handles:
Jack, doz. 30c; Jack Bolted 75c
Fore, doz. 45c; Fore, Bolted 90c
Chapin-Stephens Co.:
Carving Tool 40@40&10%
Chisel 65@65&10%
File and Awl 65@65&10%
Saw and Plane 40@40&10%
Screw Driver 40@40&10%
Millers Falls Adj. and Ratchet Auger Handles 15&10%
Nicholson Simplicity File Handle, ₱ gro. $0.85@$1.50

Hangers—

NOTE.—*Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.*

Barn Door, New Pattern, Round Groove, Regular:

Inch	3	4	5	6	8
Single Doz.	$0.90	1.25	1.60	1.95	$2.50

Barn Door, New England Pattern, Check Back, Regular:

Inch	3	4	5	6
Single Doz.	$1.30	1.85	2.50	3.00

Allith Mfg. Co.
Reliable No. 1 per doz. $12.00
Reliable No. 2 per doz. $15.00
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle 60%
Roller Bearing 60&10%
Lane Bros. Co.:
Parlor, Ball Bearing $4.15
Parlor, Standard $3.35
Parlor, New Model $3.85
Parlor New Champion $2.25
Barn Door, Standard 50&10&5%
Hinged $6.40
Covered 50&10&10%
Special 50&10&10&5%
Lawrence Bros.:
Advance 60%
Cleveland 60&10%
Crown 60%
Giant 50&10%
New York 60%
Peerless 60&10%
Sterling 60%
Swing, No. 95 60%
Union, No. 44, $5.00; No. 45 $7.00; No. 46, $9.00.
McKinney Mfg. Co.:
No. 1, Special, $15 60&10%
No. 2, Standard, $18 60&10%
Hinged Hangers, $16 50%
Meyers' Stayon Hangers 60%
C. S. Smith Mfg. Co.:
Lundy Parlor Door 50&10%
Monarch Barn Door 60&10%
Never Jump Hinge 50&10%
Peerless 60&10%
Perfection 70&5%
Phœnix 70&5%
Wagner's Adjustable 70&10%
Warehouse Anti-Friction 60%
Richards Mfg. Co.:
Pioneer Wood Track No. 3 $2.25
Imp'd Wood Track No. 5 $2.25
Imp'd Steel Track No. 7 $2.70
Imp'd Steel Track No. 7 $2.65
Ball B'r'g Steel Track No. 9 $2.50
Ball B'r'g Steel Track No. 10 $2.50
Roller B'r'g Steel Track No. 11 $2.45
Roller B'r'g Steel Track No. 12 $2.40
Ball B'r'g Steel Track No. 13 $2.75
Roller B'r'g Steel Track No. 14 $2.65
Ball B'r'g Trolley Track No. 15 40%
Ball Brg Trolley Track No. 19 40&5%
Ball Bearing Tandem Trolley Track No. 16 40%
Silent Adjustable Track No. 18 40%
Auto Adjustable Track No. 22 40%
Trolley B. D. No. 17 $1.80
Trolley F. D. No. 123 $2.70
Trolley F. D. No. 121 $2.55
Trolley F. D. No. 151 $3.00
Roller Bearing D. D. No. 25 70&5
Roller Bearing U. S. R. D. 70&5%
Anti Friction B. D. 60&10%
Ives' Wood Track No. 1 $2.15
Ives' Imp'd Wood Track No. 2 $2.15
Safety Door Hanger Co.:
Storm King Saftey 60%
U. S. Standard Hinge 60%
Stowell Mfg. and Foundry Co.:
Acme Parlor Ball Bearing 40%
Ajax Hinge Door 60%
Apex Parlor Door 50&10&5%
Atlas 60%
Baggage Car Door 50%
Climax Anti-Friction 50&10%
Elevator 40%
Express 50%
Freight Car Door 60%
Interstate 60&10%
Lundy Parlor Door 50&10%
Magic 60%
Matchless 60&10%
Nansen 70&5%
Parlor Door 53&10%
Railroad 50&10%
Rex Hinge Door 60%
Street Car Door 50%
Steel, Nos. 300, 404, 500 50&10%
Underwriter's Fire Door 40%
Wild West Warehouse Door 50%
Zenith Fire Wood Track 50&10%
A. L. Swett Iron Works:
Eagle 60&10%
Hylo 50&10%
Perfection 60%
Pilot 60%
Taylor & Boggis Foundry Co.'s Kidder's Roller Bearing 50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing 60&10%
C. J. Roller Bearing 60&10%
Cycle Ball Bearing 50%
Dwarf Ball Bearing 40%
Ives, Wood Track 60&10%
L. T. Roller Bearing 60&10&5%
New Era Roller Bearing 50&10%
O. K. Roller Bearing 60&10&5%
Prindle, Wood Track 60%
Richards' Wood Track 60%
Richards' Steel Track 50&10%
Spencer Roller Bearing 60&10%
Tandem Nos. 1 and 2 60%
Underwriters' Roller Bearing 40%
Velvet 50%
Wilcox Auditorium Ball Bearing 20%
Wilcox Barn Trolley No. 123 40%
Wilcox Elv. Door, Nos 112 and 122½ 50%
Wilcox Elv. Door, No. 132 40%
Wilcox Fire Trolley, Roller Bearing 30%
Wilcox Le Roy Noiseless Ball Bearing 40%
Wilcox New Century 50&10&10%
Wilcox O. K. Steel Track 50%
Wilcox O. K. Trolley 50%
Wilcox Trolley Ball Bearing 40%
Wilcox Wideman Narrow Gauge, Ball Bearing 40%
For Track, see *Rail*

Extra 5@10% often given.

Hangers, Garment—

Western, W. G. Co. 70&10%

Gate—

Myers' Patent Gate Hangers, ₱ doz net 4.50

Hasps—

McKinney's Perfect Hasp, ₱ doz. 50%

Hatchets—

Regular list .40@50%

Heaters, Carriage—

Clark, No. 3, $2.25; No. 5D, $2.75; No 3E, $4.25; No. 1, $4.50 each 15%
Clark Coal, $0.75 ₱ doz. 10%

Hinges—
Blind and Shutter Hinges—

Surface Gravity Locking Blind: (Victor; National; 1888 O P Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	1	3	5
Doz. pair	$0.85	1.75	3.50

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	1	1½	2	2½
Doz. pair	$0.70	.65	.60	.55

Mortise Reversible Shutter, (Buffalo, &c.)

No.	1	1½	2
Doz. pair	$0.75	.70	.65

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 10%
Parker 70@75%
Reading's Gravity 50&5%
Sargent's, Nos. 1, 3, 5, 11 & 13 70&10@75%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets, without screws, $0.80; with screws, $1.15.
Wrightsville H'dware Co.:
O. S., Lull & Porter 7 &5%
Acme, Lull & Porter 45%
Queen City Reversible 75%
Stenger's Positive Locking, Nos. 1 & 3 70&10%
Shepard's Noiseless, Nos. 60, 65, 55... 70&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5 75%
1885, Old Pat'n, Nos. 1, 3 & 5 75%
Tip Pat'n, Nos. 1, 3& 5 75%
Buffalo Gravity Locking, Nos. 1, 3 & 5 75%
Shepard's Double Locking, Nos. 20 & 25 70%
Champion Gravity Locking, No. 75 75%
Steamboat Gravity Locking, No. 10 75%
Pioneer, Nos. 060, 45 & 5½ 75%
Empire, Nos. 101 & 103. 70%
W. H. Co.'s Mortise Gravity Locking, No. 2 60%
Whipple's Patent Automatic 30%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with Latches	$3.00	2.70	5.00
Hinges only	$1.40	2.05	3.80
Latches only	.70	.70	.35

New England:
With Latch doz. @$2.00
Without Latch doz. @$1.90
Reversible Self-Closing:
With Latch doz. @$1.75
Without Latch doz. @$1.35
Western:
With Latch doz. $1.75
Without Latch doz. $1.15
Wrightsville H'dware Co.:
Shepard's or Clark's, doz. sets.

No.	1	2	3
Hinges with Latches	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	1.35

Spring Hinges—

Holdback Cast Iron gro. $9.00@9.50
Non-Holdback, Cast iron, gro. $8.00@8.50

Extra 5@10% often given.

J. Bardsley
Bardsley's Non-Checking Mortise Floor Hinges 45%
Bardsley's Patent Checking 15%
Bommer Bros.:
Bommer Ball Bring Floor Hinges 40%
Bommer Spring Hinges 40%
Chicago Spring Butt Co.:
Chicago Spring Hinges 25%
Triple End Spring Hinges 50%
Chicago (Ball Bearing) Floor Hinge 50%
Garden City Engine House 25%
Keene's Saloon Door 25%
Columbian Hdw. Co.:
Acme, Wrt. Steel 30%
Acme, Brass 25%
American 30%
Columbia, No. 14 ₱ gr. $9.00
Columbia, No. 18 ₱ gr. $25.00
Columbia, Adjustable, No. 7, ₱ gr. $12.00
Gem, new list 30%
Clover Leaf ₱ gr. $12.50
Oxford, new list 30%
Lawson Mfg. Co.:
Matchless 35%
Matchless Pivot 45%
Shelby Spring Hinge Co:
Crown Jamb Hinge 40%
Chief Ball Bearing Floor Hinge 45%
Royal Ball Bearing Floor Hinge 45%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₱ gr $12.50
Ideal, No. 4 ₱ gr. $9.00
New Idea No. 1 ₱ gr. $9.00
New Idea, Double Acting 35%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list Mar. 15, 1901:
Light Strap Hinges 80&25%
Heavy Strap Hinges 80&20&10%
Light T Hinges 75&10&5%
Heavy T Hinges 75&5%
Extra Heavy T Hinges 80&2½%
Hinge Hasps 70%
Cor. Heavy Strap 80&20&10%
Cor. Ex. Heavy T 80&20
} Ex 10&5@10&10&5%

Screw Hook and Strap. { *6 to 12 in* lb. 3½c; *14 to 20 in* lb. 3c; *22 to 36 in* lb. 2½c }

Screw Hook and Eye:
¾ to 1 inch lb. 6 c
⅝ inch lb. 7 c
½ inch lb. 9 c

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers 35%

Hods, Coal—

	15	16	17	18 inch.
Galv. Open	$2.50	2.75	3.00	3.25 ₱ doz.
Jap. Open	$2.00	2.25	2.50	2.75 ₱ doz.
Galv. Funnel	$3.00	3.25	3.50	3.75 ₱ doz.
Jap. Funnel	$2.50	2.75	3.00	3.25 ₱ doz.

Masons, Etc.—

Cleveland Wire Spring Co.:
Steel Mortar each $1.45
Steel Brick each $1.10

Hoes— Eye—

Scovil and Oval Pattern 60&10@60&10&10%
Grub, list Feb. 25, 1899 70@70&10%
D. & H. Scovil 35%

Handled—

Aug. 1, 1899, List:
Field and Garden 70&10%
Smith's Patent 50%
Meadow & Rhode Island 75%
Black Diamond 70&10%
Mortar and Street 70&10&10%
Planters' 75&12½%
Cotton 70&10&10%
Cotton Chopper 75&12½%
Weeding Hoes 66⅔&15%
Steel Weeders 66⅔&15%
Malleable Weeders 66⅔&15%
Ft. Madison Cotton Hoe 75&7½%
Ft. Madison Crescent Cultivator Hoe, per doz 75&10%
Ft. Madison Mattock Hoes:
Regular Weight ₱ doz. $5.00
Junior Size ₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz. $4.00
Ft. Madison Dixie Tobacco Hoe 75&20%
Kretsinger's Cut Easy 70&10%
Warren Hoe 55%
W. & C. Ivanhoe 75&2%
B. B. 6 in., Cultivator Hoe $3.15
B. B., 6½ in. $3.35
Acme Weeding ₱ doz., net, $4.35
W. & C. Lightning Shuffle Hoe, ₱ doz. $4.85

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ₱ doz. $24.00 45&10%

Door—

Empire 50%
Bardsley's 45%

File and Tool—

Nicholson File Holders and File Handles 33⅓&10%

Hooks—

Hooks, Bench, see *Stops, Bench.*

Cast Iron—

Bird Cage, Reading 50&10%
Bird Cage, Sargent's List 40%
Ceiling, Sargent's List 50&10%
Clothes Line, Reading List 50%
Clothes Line, Sargent's List. 50&20&10%
Coat and Hat, Sargent's List. 50@50&10%
Clothes Line, Stowell's 70%
Coat and Hat, Reading 50%
Coat and Hat, Stowell's 70%
Coat and Hat, Wrightsville 65%
Harness, Reading List 50&10%
Harness, Stowell's 60%
School House, Stowell's 70%

Wire—

Belt 80&10%
Wire C. & H. Hooks 75@75&10%
Atlas, Coat and Hat:
Single Cases 70%
10 Case Lots 70&10%
Columbian Hdw Co. Gem 60&10%
Parker Wire Goods Co.: King 70&10%

Wire Goods Co:
Acme.....60&10%
Chief.....70%
Crown.....70&10%
Czar.....65%
V Brace.....70&10%
Czar Harness.....50&10%

Wrought Iron—
Box, 6 in., per doz. $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....doz. $1.05@1.25
Wrought Staples, Hooks, &c.—
See *Wrought Goods.*

Miscellaneous—
Bush, Light, doz. $5.50; Medium, $6.00; Heavy, $6.50
Grass.....Nos. 1 2 3 4
Best..... $1.50 1.75 2.00
Common.. $1.30 1.50 1.50 1.60
Potato and Manure .....60&15%
Whipletree.....lb. 5¾@6c
Hooks and Eyes:
Brass.....60&10&10@70%
Malleable Iron.....70&5@70&10%
Covert Saddlery Works' Self Locking Gate and Door Hook.....60%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $5.25 net
Bench Hooks—See *Bench Stops.*
Corn Hooks—*See Knives. Corn.*

Horse Nails—See *Nails. Horse Horseshoes—*
See *Shoes, Horse.*

Hose Rubber—
Garden Hose, ¾-inch:
Competition.....ft. 4½@ 5 c
3-ply Standard.....ft. 6½@ 7 c
4-ply Standard.....ft. 7½@ 8 c
3-ply extra.....ft. 8½@ 9 c
4-ply extra.....ft. 10 @10½c
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 6 @7 c
Fair quality.....ft. 8 @9 c

Irons— Sad—
From 4 to 10.....lb. 2¾@3 c
B. B. Sad Irons.....lb. 3½@3½c
Chinese Laundry.....lb. 4¾@5c
Chinese Sad.....lb. 4@4¼c
Mrs. Potts', per set:
Nos..... 50 55 60 65
JapdTops 71 68 81 78
TinaTops 74 71 84 81
New England Pressing.lb.. 3¾@4c

Pinking—
Pinking Irons.....doz. 50@60c

Soldering—
Soldering Coppers 2¼ and 3..19@20c
1¼ and 2.....21@22c

Jacks Wagon—
Covert Mfg. Co.:
Auto Screw.....80a&5%
Steel.....45a&2%
Covert's Saddlery Works':
Daisy.....60&10%
Victor.....60&10%
Lockport.....50%
Lane's Steel.....30&10%

Kettles—
Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See *Ware, Hollow.*

Knives—
Butcher, Kitchen, &c.—
Foster Bros.' Butcher, &c.....30%
Smith & Hemenway Co.....40&10%
Wilkinson Shear & Cutlery Co.....50%
Hay and Straw—See *Hay Knives.*

Corn—
Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—
Standard List.....70&5@70&10%
Brailey's.....35%
C. E. Jennings & Co. Nos. 45, 46..60&10%
Jeanings & Griffin. Nos. 51, 52. 60&10&10%
Swan's.....70&10&2½%
Watrous.....16⅔&10%
L. & I. J. White.....20a&5@25%

Hay and Straw—
Lightning.....₱ doz. $6.50@7.00
Iwan's Sickle Edge.....₱ doz. $10.00
Iwan's Serrated.....₱ doz. $10.00
Maine.....₱ doz. $8.50

Mincing—
Buffalo.....₱ gro. $13.00

Miscellaneous—
Farriers'.....doz. $3.00@3.25
Wostenholm's.....₱ doz. $3.00@3.25

Knobs—
Base, 2¼-inch, Birch, or Maple, Rubber tip, gro.....$1.10@1.15
Carriage, Jap, all sizes..gro. 40@45c
Door, Mineral.....doz. 65@70c
Door, Por. Jap'd.....doz. 70@75c
Door, Por. Nickel....doz. $2.05@2.15
Bardsley's Wood Door, Shutter, &c...15%
Picture, Sargent's.....60&10&10%

Lacing Leather—
See *Belting Leather—*

Ladders, Step, Etc.—
Lane's Store.....25%
Myers Noiseless Store Ladders.....30%

Ladies— Melting—
L. & G. Mfg. Co, Low List.....25%
P. S. & W.....50%
Reading.....40&10%
Sargent's.....45&10%

Lanterns— Tubular—
Regular Tubular No. 0. doz. $4.35@4.75
Lift Tubular..No. 0..doz. $4.75@5.25
Hinge Tubular. No. 0..doz. $4.75@5.25
Other Styles.....40&10@40&10&5%

Bull's Eye Police—
No. 1. 2¾ inch.....$2.50@2.75
No. 2. 3 inch.....$2.75@3.00

Lasts and Stands Shoe—
Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....30%

Latches—
Thumb—
Roggin's Latches, with screw. dz35@40c

Leaders Cattle—
Small.....doz. 55c; large. 60c
Covert Mfg. Co.....45a&2%

Lifters, Transom—
R & E.....33⅓%

Lines—
Wire Clothes, Nos... 18 19 20
100 feet.....$2.20 2.00 1.65
75 feet.....$1.80 1.70 1.30
Samson Cordage Works:
Solid Braided Chalk, No. 0 to 3.....40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gr.....20%
Masons' Lines, Shade Cord, &c.: White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25..20%
Anniston Waterproof Clothes, 50 ft., ₱ gro.: $26.00; Gilt Edge, $24.00; Air Line $24.00; Acme, $19.00; Alabama, $17.00; Empire, $18.00; Advance, $15.00; Oriole, $22.00; Albermarle, $15.00; Eclipse, $18.50; Chicago, $12.50; Standard, $11.00; Columbia, $9.50.

Locks— Cabinet—
Cabinet Locks.....33⅓&3&3&7½%

Door Locks, Latches, &c.—
[Net prices are very often made on these goods.]
Reading Hardware Co.....50%
R. & E. Mfg. Co.....40%
Sargent & Co.....40&10%
Stowell's Steel Door Latches.....30%

Elevator—
Stowell's.....50%

Padlocks—
Wrought Iron.....75&10&5@80&5%
R. & E. Mfg. Co. Wrt. Steel and Brass... 75@.5&10%

Sash, &c.—
Iyes' Patent:
Bronze and Brass.....62½%
Crescent.....50%
Iron.....62½%
Wrought Bronze and Brass.....55%
Wrought Steel.....55%
Reading.....net 50%

Machines— Boring—
Com., Upright, Without Augers..$2.00
Com., Angular, Without Augers..$2.25
Without Augers.
R. & E. Mfg. Co.: Upright. Angular.
Improved No. 3. $4.25 No. 1 $5.00
Improved No. 4. 3.75 No. 2. 3.38
Improved No. 5. 2.75
Jennings'..No. 4, 3.15 No. 1, 3.50
Millers' Falls..... 5.75
Snell's, Rice's Pat. 2.50 2.75

Corking—
Reisinger Invincible Hand Power..... ₱ doz. $48.00

Fence—
Williams' Fence Machines.....each, $5.50

Hoisting—
Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.20%

Ice Cutting—
Chandler's.....15&10%

Washing—
Boss Washing Machine Co.: Per doz.
Boss No. 1; Boss Rotary.....$37.00
Boss No. 7; Dietz Rotary.....60.00
Champion Rotary; Banner No. 1..54.00
Standard Champion No. 1.....48.00
Standard Perfection.....26.00
Cinti Square Western.....30.00
Uneeda American, Round.....29.00

Mallets—
Hickory.....45&5@50%
Lignumvitæ.....45&5@50%
Tinners', Hickory and Applewood, doz.....50@55c

Mashers, Vegetable—
Western, W. G. Co., Potato.....60&10%

Mats— Door—
Elastic Steel (W. G. Co.).....10%

Mattocks—
See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk*

Mills— Coffee, etc.—
Enterprise Mfg. Co.....25@30%
National, list Jan. 1, 1904.....30%
Parker's Columbia & Victoria.50&10@60%
Parker's Box and Side.....50&10@60%
Sun, No. 1080, 1 lb mill.....₱ doz $3.00
Swift, Lane Bros Co.....30%

Mowers, Lawn—
Net prices are generally quoted.
Cheap.....all sizes. $1.75@2.00
Good.....all sizes, $2.25@2.50

	10	12	14	16-inch
High Grade	4.25	4.50	4.75	5.00

Continental.....60&5%
Great American.....70%
Great American Ball Bearing, new list.70%
Quaker City.....70%
Pennsylvania.....60&5%
Pennsylvania, Jr., Ball Bearing.....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Philadelphia:
Styles M., S., C., K. T.....70&5%
Style A, all Steel.....60&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, low list...40&5%

Nails—
Cut and Wire. See Trade Report.
Wire Nails and Brads, Papered. List July 20, 1899.....85&10&10@90%
Hungarian, Finishing, Upholsterers', &c. See Tacks.

Horse—

Nos.	6	7	8	9	10	
A. C.	25	23	22	21	21	40&2%
C. B. K.	25	23	22	21	21	40%
Anchor	23	21	20	19	18	40&5%
Champ'n.	26	24	23	23	23	50%
Coleman	13	12	12	11	11	net
Maud S.	25	23	22	21	21	50%
New Haven	23	21	20	19	18	40&5%
Putnam	23	21	20	19	18	33⅓&5%
New "	19	18	17	16	16	10&10%

Western, per lb.....8½¢
Jobbers' special brands, per lb. 8@8½¢

Picture—

	1½	2	2½	3	3½ in.
Brass Head.	.45	.60	.70	.95	1.00 gro.
Por. Head.	..	1.10	1.10	1.10	.. gro.

Nippers, See *Pliers and Nippers.*

Nuts—
Cold Punched: Off list.
Mfrs. or U. S. Standard.
Square, plain.....$5.10
Hexagon, plain.....$5.60
Square, C. T. & R.....$5.30
Hexagon, C. T. & R.....$6.00
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square Blank.....$6 00
Hexagon Blank.....$6.50
Square Tapped.....$6 00
Hexagon Tapped.....$6 50

Oakum—
Best or Government.....lb. 6¼c
Navy.....lb. 4¾c
U. S. Navy.....lb. 5¾c
Plumbers' Spun Oakum.....2¾c
In carload lots ¼c lb. off f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—
Brass and Copper.....50&10%
Tin or Steel.....70&10@75%
Zinc.....65&10%
Chase or Paragon:
Brass and Copper.....45&10@50%
Tin or Steel.....75@75&10%
Zinc.....65%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₱ doz. 20%
Malleable, Hammers' Old Pattern, same list.....50&10%
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers etc.....60@60&10%

Openers— Can—
French.....doz. 35c
Iron Handle.....doz. 25@27c
Sprague, Iron Hdle..per doz. 35@40c
Sardine Scissors...doz. $1.75@$3.00
Marvel.....per doz. $1.25
National.....50%
Stowell's Sprague.....per doz. 35@45c
Tip Top.....per doz. $0.75
Triumph Shear.....₱ gro. $9.00

Egg—
Nickel Plate.....per doz., $2.00
Silver Plate.....per doz., $4.00

Packing—
Asbestos Packing, Wick and Rope, 14½@15c lb.

Rubber—
Sheet, C, I.....8@10c
Sheet, C. O. S.....9@13c
Sheet, C. B. S.....10@11c
Sheet, Pure Gum.....50@65c
Sheet, Red.....40@50c
Jenkins' Standard, ₱ lb 80a...25@25a&5%

Miscellaneous—
American Packing.....7@10c lb.
Cotton Packing.....16@25c lb.
Italian Packing.....9@12½c lb.
Jute.....4@4½c lb.
Russia Packing.....8@11c lb.

Pails— Creamery
S. S. & Co., with gauges.. No 1 $6.25; No. 2, $6.50 ₱ doz.

Galvanized—
Price per doz.

	Quart.	*10*	*12*	*14*
Water, Regular..		1.50	1.75	2.00
Water, Heavy...		2.75	3.00	3.25
Fire, Rd. Bottom.		2.30	2.60	2.80
Well.....		2.25	2.50	2.75

Pans— Dripping—
Standard List.....60c&10@60c&10c&5%

Fry—
Common Lipped:

No.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.35*	*1.00*	*1.10*	*1.30*	*1.50*

Roasting and Baking—
Regal, S. S. & Co., ₱ doz., Nos. 5, $4.50; 10 $5.25; 20, $5.75; 30, $6.25.
Savory, ₱ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ₱ gro.:

No.	40	50	60	140	150	160
	$30.00	35.00	42.00	31.00	39.00	48.00

Paper—Building Paper—
Asbestos: *lb.*
Building Felt.....2¾c
Mill Board, sheet, 40 x 40 inches 3½c
Mill Board, roll, thicker than 1-16 inch.....3½c
Mill Board, roll, 1-16 in. thick and less.....2¼c

Per roll
Rosin Sized Sheathing: 500 sq. ft.
Light wt., 25 lbs. to roll..$0.40@0.45
Medium wt., 30 lbs. to roll..$0.45@0.50
Heavy wt., 40 lbs. to roll..$0.65@0.70
Black Water Proof Sheathing, 500 Sq. ft., 1 ply, 65c; 2 ply, 85c; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb., ton.....$41.00
Red Rope Roofing, 250 sq. feet per roll.....$1.75
NOTE.—*These goods are often sold at delivered prices.*

Tarred Paper.
1 ply (roll 300 sq. ft.), ton..$32.50@35.50
2 ply, roll 108 sq. ft.....55@60c
3 ply, roll 108 sq. ft.....78@80c
Slater's Felt (roll 500 sq. ft.).....75c
NOTE.—*Above prices often include delivery, and are for Eastern territory, where prices are controlled by agreement between the manufacturers. In open territory much lower prices are current.*
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.).....$2.00

Sand and Emery—
Flint Paper and Cloth...50c&10@60%
Garnet Paper and Cloth.....25%
Emery Paper and Cloth...50c&10@60%

Parers— Apple—
Advance.....₱ doz. $4.50
Baldwin.....₱ doz. $5.00
Bonanza Improved.....each $6.50
Daisy.....₱ doz. $4.00
Dandy.....each $7.50
Eureka Improved.....each $20.00
Family Bay State.....₱ doz. $15.00
Improved Bay State.....₱ doz. $36.00
Little Star.....₱ doz. $5 00
New Lightning.....₱ doz. $7.50
Reading 72.....₱ doz. $4.00
Reading 78.....₱ doz. $7.00
Rocking Table.....₱ doz. $6.00
Turn Table '98.....₱ doz. $6.75
White Mountain.....₱ doz. $6.00

Potato—
Saratoga.....₱ doz. $7.00
White Mountain.....₱ doz. $6 00

Picks and Mattocks—
List Feb. 23, 1899.....70@70&10%

Pinking Irons—
See *Irons, Pinking.*

Pins— Escutcheon—
Brass.....60@60&10%
Iron, list Nov. 11, '85.....60@60&10%

Pipe, Cast Iron Soil—
Standard, 2-6 in.....50&10
Extra Heavy, 2-6 in.....65%
Fittings.....70%

Pipe, Merchant,
Steel Carload Lots,

	f.o.b, Pittsburgh. Merchant Pipe.	*Galvanized.*
⅛, ¼, ⅜ inch.....	*68%*	*58%*
½-inch.....	*71%*	*61%*
¾ to 6 inch.....	*75%*	*65%*
7 to 12 inch.....	*71%*	*61%*

Pipe, Sewer—
Jobbers' Prices—
Standard Pipe and Fittings, 2 to 24 in.
New England.....67%
New York and New Jersey.....70%
Maryland, Delaware, East Penn..72%
West Penn and West Va.....73%
Virginia.....75%
Ohio, Michigan and Ky.....75%
Indiana.....77%
Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested Stove Pipe:	C. L.	L. C. L.
5 in., per 100 joints....	$7.50	$8 50
6 in., per 100 joints....	8.00	9.00
7 in., per 100 joints....	9.00	10.00

Planes and Plane Irons—
Wood Planes—
Bench, First quality....40c&5@40c&10%
Bench, Second qual.....60c&5@50c&10%
Molding.....33⅓&5@33⅓&10%
Bailey's (Stanley R. & L. Co) 5&10@25&10&10%
Chapin-Stephens Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality.....50@50&10%
Molding.....33⅓@33⅓&10%
Toy and German.....40@40&10%
Gage Self Setting.....35%
Union.....60%

Iron Planes—
Bailey's (Stanley R. & L. Co).....25&10@25&10&10%
Chaplin's Iron Planes.....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....20&10@20&10&10%
Sargent's.....60@60&10%
Union.....60%

Plane Irons—
Wood Bench Plane Irons.....30c&5@30c&10%
Buck Bros.....30%
Chapin-Stephens Co.....30@30&10%
Stanley R. & L. Co...20&10@20&10&10%
L. & I. J. White.....20a&5@25%

Planters, Corn, Hand.
Kohler's Eclipse.....₱ doz. $8.50

Plates—
Felloe.....lb. 3¾@4c
Self-Sealing Pie Plates (S. S. & Co.), ₱ doz. $2.00.....50%

Pliers and Nippers—
Button Pliers.....75@75c&10%
Gas Burner, per doz., 5 in., $1.25@ $1.30; 6 in., $1.45@$1.50
Gas Pipe.. 7 8 10 12-in.
$3.00 $3.25 $3.50 $3.75
Acme Nippers.....50@50&5%
Bernard's:
Cutting Nippers.....33⅓%
Parallel, Pliers.....33⅓%
Paragon Pliers.....50%
Lodi Pliers.....50%
Elm City Fence Pliers.....33⅓%
Cronk & Carrier Mfg. Co.:
American Button.....75&10%
Cronk's.....60%
Improved Button.....70&10%
Stub's Pattern.....50%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers, and Tools 40&10@40&10&10%
P., S. & W. Tinners' Cutting Nippers. 30@30&10%
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—
Chapin Stephens Co.:
Plumbs and Levels.....30@30&10&10%
Chapin's Imp. Brass Cor..40@40&10&10%
Pocket Levels.....30@30&10&10%
Level Glasses.....60@60&10&10%
Disston's Plumbs and Levels.....70%
Disston's Pocket Levels.....70%
C. E. Jennings & Co.'s Iron.....25&10%
C. E. Jennings & Co.'s Iron, Adjustable. 33⅓&10%
Stanley R. & L. Co....20&10@30&10&10%

Stanley's Duplex.....20@20&10&10%
Woods' Extension.....33⅓&5

Poachers, Egg—

Buffalo Steam Egg Poachers, ₱ doz., No. 1, $6.00; No. 2, $8.00; No. 3, $10.00; No. 4, $12.00.....50&5

Points, Glaziers'—

Bulk and 1 lb. papers.....*lb.* 6¼c
¼-lb. papers.....*lb.* 6½c
¼-lb. papers.....*lb.* 6¾c

Pokes, Animal—

Ft. Madison Hawkeye.....₱ doz. $3.25
Ft. Madison Western.....₱ doz. $4.00

Police Goods—

Manufacturers' Lists.....25@25&5%
Tower's.....25%

Polish—Metal—

Prestoline Liquid, No. 1 (½ pt.), ₱ doz. $3.00; No. 2 (1 qt.), $9.72.....40%
Prestoline Paste.....40&10%
George William Hoffman:
U. S. Metal Polish Pasce, 3 oz. boxes, ₱ doz. 50¢; ₱ gr. $4.50; ½ ℔ boxes, ₱ doz. $1.25; 1 ℔ boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz. $1.25; ₱ gr. $12.00.
Barkeepers' Friend Metal Polish, ₱ doz. $1.75; ₱ gr. $18.00.
Wynn's White Silk, ¼ pt. cans, ₱ doz.....$2.00

Stove—

Black Eagle Benzine Paste, 5 ℔ cans.....
₱ ℔ 10¢
Black Eagle, Liquid, ½ pt. cans ₱ doz. 75¢
Black Jack Paste, ¾ ℔ cans, ₱ gro. $9.00
Black Kid Paste, 5 ℔ can.....each, $0.65
Ladd's Black Beauty, gr. $10.00.....50%
Joseph Dixon's, ₱ gr. $5.75.....10%
Dixon's Plumbago.....₱ ℔ 8¢
Fireside.....₱ gr. $2.50
Gem, ₱ gr. $4.50.....10%
Japanese.....₱ gr. $3.50
Jet Black.....₱ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.....
₱ doz. $1.50
Wynn's:
Black Silk, 5 ℔ pail.....each 70¢
Black Silk, ½ ℔ box.....₱ doz. $1.00
Black Silk, 5 oz. box.....each, $0.75
Black Silk, ½ pt. liq.....₱ doz. $1.00

Poppers, Corn—

1 qt., Square.....*gro. $9.00*
1 qt., Round.....*gro. $10.00*
1½ qt., Square.....*gro. 11.00*
2 qt., Square.....*gro. 13.00*

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts, each.....$1.30

Potato Parers—

See *Parers, Potato.*

Pots— Glue—

Enameled.....40%
Tinned.....35%

Powder—

In Canisters:
Duck, 1 lb. each.....45c
Fine Sporting, 1 lb. each.....75c
Rifle, ½-lb. each.....15c
Rifle, 1-lb. each.....25c
King's Semi-Smokeless:
Keg (25 ℔ bulk).....$6.50
Half Keg (12½ ℔ bulk).....$3.50
Quarter Keg (6¼ ℔ bulk).....$1.90
Case 24 (1 ℔ cans bulk).....$8.50
Half case (1 ℔ cans bulk).....$4.50

King's Smokeless:	Shot Gun	Rifle
Keg (25 ℔ bulk)	$12 00	$15.00
Half Keg (12½ ℔ bulk)	6.25	7.75
Quarter Keg (6¼ ℔ bulk)	3.25	4.00
Case 24 (1 ℔ cans bulk)	14.00	17 00
Half case 12 (1 ℔ cans blk)	7.25	8 75

Robin Hood smokeless Shot Gun..50&20%

Presses—

Fruit and Jelly—

Enterprise Mfg. Co.....20@25%
Sensible.....33⅓&5
2 qt., $2.00; 4 qt., $4.00; 10 qt., $6.00 each.

Seal Presses—

Morrill's No. 1, per doz. $20.00.....50%

Pruning Hooks and Shears—See *Shears.*

Pullers, Nail—

Cyclops.....50%
Dudly Improved Nail Puller.....50%
Miller's Falls, No. 3, per doz. $12.00.....
33⅓&10%
Pearson No. 1, Cyclone Spike Puller, each $30 00.....50%
Pelican, ₱ doz. $9.00.....40&10%
Scranton, Case Lots:
No. 2 B (large).....$5.50
No. 3 B (small).....$3.00
Smith & Hemenway Co.:
Ajax.....60%
Diamond R, No. 2, ca-e lots, ₱ doz $6.00
Diamond R, No. 3, case lots, ₱ doz $5.50
Eureka.....50%
Giant, No. 1, ₱ doz. $18; No. 2, $16.50; No. 2, $15.....40%
Yankee.....60&5

Pulleys—Single Wheel—

Inch.....	*2*	*2½*	*3*
Awning, ..doz	*$0.55*	*.85*	*1.15*

Hay Fork, Swivel or Solid Eye.....
doz., 4 in., $1.15; 5 in., $1.40

Inch	*2*	*2¼*	*2½*
Hot House..doz	*$0.70*	*.90*	*1.25*
Inch	*1½*	*1⅝*	*1¾*
Screw.....doz	*$0.16*	*.19*	*.23*
Inch	*1¼*	*2*	*2¼*
Side.....doz	*$0 30*	*.40*	*.55*
Inch.....	*1¾*	*1¾*	*2*
Tackle....doz	*$0.30*	*.42*	*.58*

2½ *3*
2¼ *2½*
.30 *.50*
2¼ *2½*
.63 *1.00*
2 *2¼*
1.00

Stowell's:
Ceiling or End, Anti-Friction..60&10%
Dumb Waiter, Anti-Friction..60&10%
Electric Light.....60%
Side, Anti-Friction.....60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz., 1¾ and 2 in...16@19c
Auger Mortise, no Face Plate, per doz. 1¾ and 2 in......16@19c
Auger Mortise, with Face Plate, per doz., 1¾ and 2 in......16@19c
Acme.....1¾ in., 16¢; 2 in., 19¢
Common Sense, 1¾ in.... ₱ doz., 18¢; 2 in., 20¢.
Fox-All-Steel, Nos. 3 and 7, 2 in. ₱ doz 50%
Grand Rapids All Steel Noiseless....50%
Ideal.....70&5%
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy....1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See *Blocks.*

Pumps—

Cistern.....*60@60&10%*
Pitcher Spout.....*80@80&10%*
Wood.....*50@50&10%*

Pump Leathers—

Plunger and Lower Valve—Per gro.:

Inch..	*2*	*2¼*	*2½*	*2¾*
	$2.20	*2.50*	*2.75*	*3.00*
Inch..	*3*	*3¼*	*3½*	*3¾*	*4*
	$3.30	*3.60*	*3.85*	*4.10*	*4.40*

Plunger Cup Leathers—Per 100:

Inch	*2½*	*3*	*3½*	*4*
	$2.75	*3 85*	*5.00*	*6.00*

Barnes Dbl. Acting (low list).... 50&10%
Contractors' Rubber Diaphragm No. 2 B. & L. Block Co.....$16.00
Daisy Spray Pump.....₱ doz. $7.20
Flint & Walling's Fast Mail (low list).55%
Flint & Walling's Pitcher Spout.....80%
National Specialty Mfg. Co., Measuring, $6.00.....90%
Mechanical Sprayer.....$7.20
Myer's Pumps, low list.....50%
Myers' Power Pumps.....50%
Myers' Spray Pumps.....50%

Punches—

Saddlers' or Drive, good..doz. 65@70c
Spring, single tube, good quality...
$1.75@2.00
Revolving (4 tubes)...doz. $3.50@3.75
Bemis & Call Co.'s Cast Steel Drive....50%
Bemis & Call Co.'s Check.....55%
Benard Spring Belt Punches.....33⅓%
Lodi Spring Belt Punches.....50%
Morrill's No. 1 (A.B.C.), ₱ doz., $15.00..50%
No. 2, ₱ doz. $22.50.....50%
Hercules, each $7.50.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Paragon Spring Belt Punches.....50%
Steel Screw, B & K. Mfg Co.....40%
Tinners' Hollow, P., S. & W. Co.35@35&5%
Tinners' Solid, P., S. & W. Co., ₱ doz., $1.44.....60%

Rail— Barn Door, &c.—

Cast Iron, Barn Door: Flange Screw Holes for Rd. Groove Wheels:

	⅛	⅝	¾	*In.*
	$1.70	*$2.10*	*$3 00*	*100 feet.*

Angular for Sq. Groove Wheels:

Small.	*Med.*	*Large.*	
$1.50	*1.90*	*2.60*	*100 feet.*

Sliding Door, Iron Painted..2½@3¼c
Sliding Door, Wrought Brass, 1½ in.....lb.36c...30%
Allith Mfg. Co., No. 1, Reliable Hanger Track, ₱ foot.....8¢
Allith Mfg. Co., No. 2, Reliable Hanger Track, ₱ foot.....10¢
Cronk's Double Braced Steel Rail, ₱ foot.....3½¢
Cronk's O. N. T. Rail.....3½¢
Lane's Hinged Track, ₱ 100 ft., 1 in., $3.70; 1¼ in., $4.40
Lanes' O. N. T., ₱ 100 ft., 1 inch, $3.00; 1¼ inch, $3.70; 1¾ inch, $4.00.
Lanes' Standard, 1¾ in., ₱ 100 ft 4.00
Lawrence Bros., ₱ ft. 11¢.....60%
Lawrence Bros. New York.....3½¢
McKinney's Hinged Hanger Rail ₱ foot, 11¢.....50%
McKinney's None Better.....₱ ft. 3½¢
McKinney's Standard .....₱ ft. 4 ¢
Myers' Stayon Track .....50&10%
Safety Door Hanger Co.'s Storm King Safety.....60%
Safety Door Hanger Co.'s U.S. Standard 60%
Smith's Wrought Bracket, Plain.....3½¢
Smith's Special.....4½¢
Smith's Never Jump, per ft. 11¢.....50%
Smith's Plain Steel 30%
Smith's Milled Steel.....4½¢
Stowell's Cast Rail .....₱ ft. 1½¢
Stowell's Steel Rail, Plain.....2½
Stowell's Wrought Bracket, 1 3-16 in. .....₱ ft. 3¢
Stowell's Wrought Bracket, 1¼x5-16.....
₱ ft. 7¢
Swett's Hylo, per ft. 11¢.....50&10%
Swett's P. L. B. Steel Rail, ₱ 100 ft. $3.00

Rakes—

Net Prices, Malleable Rakes:

10	*12*	*14*	*16-tooth*
Shank.....$1.50	*1.60*	*1.75*	*1.85*
Socket.....$1.65	*1.80*	*1.95*	*2.10*

Steel, Garden and Gravel, Aug. 1, '99 List 70%
Weldless Steel .....75&5%
Malleable Iron, Garden.....*70&10%*
Lawn Rakes, Metal Head, per doz.,
20 teeth.....*$3.25@3.50*
24 teeth.....*$3.50@3.75*
Fort Madison Red Head Lawn.....$3 25
Fort Madison Blue Head Lawn.....$3.00
Jackson Lawn, 29 and 30 teeth, ₱ doz., net, $4.25
Kohler's:
Lawn Queen, 20-tooth, ₱ doz.....$3.45
Lawn Queen, 24-tooth, ₱ doz $3.60
Paragon, 20 tooth, ₱ doz.....$2.75
Paragon, 24-tooth, ₱ doz.....$3.00
Steel Garden, 14-tooth, ₱ doz..$2.88
Malleable Garden, 14-tooth, ₱ doz..$2.00

Rasps, Horse—

Disston's.....75%
Heller Bros.....70&5&10&10&5%
McCaffrey's American Standard.....
60&10&5%
New Nicholson.....50&10&75%
See also *Files.*

Razors—

Borsalie.....60 & 10%
Fox Razors, No. 62...₱ doz. $30.00
Fox Razors, No. 44, ₱ doz. $20.00
Fox Razors, No. 97, Platina, ₱ doz. $25.00

Red Devil.....60%
Silberstein:
Carbo Magnetic.....$18.00
Griffon, No. 65.....$15.00
Griffon, No. 00.....$12.00
All other Razors.....40%

Safety Razors—

Safety Razors.....40%
New Gem, in Tin Boxes.....₱ doz. $12.00
New Gem, Extra Blades.....₱ doz. $8.35
Gem Outfits (Razor, Strop, etc.).....
₱ doz. $25.80
Complete Razor, extra Blade in Leather Case.....₱ doz. $27.00
Silberstein.....40%

Reels— Fishing—

Bishop's Independent Fish Reel Spooler, ₱ doz.....$30.00
Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber Populo, Nickeled Populo.....20%
Aluminum, German Silver, Bronze..25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 26 PN.....20%
2904 P.....33⅓%
2904 PN.....33⅓%
0924 N.....33⅓%
02084 N.....33⅓%
002904 PN.....33⅓%
802 N.....33⅓%
986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 0°304 PN.33⅓%

Registers—*List July 1, 1903.*

Black Jap
White Jap
Bronzed
Nickel Plated
Electro Plated
70¢ 100&75 & 10%

Registers, Cash—

Sun, No. 10, Metal Cabinet.....$30.00
Sun, No. 10, Wood Cabinet.....$25.00

Revolvers—

Single Action.....*85@90c*
Double Act'n, except 44 cal......*$1.90*
Double Action, 44 caliber.....*$2.05*
Automatic.....*$5.60*
Hammerless.....*$4.10*
Note.—Jobbers frequently cut the above prices of manufacturers for small trade.

Riddles, Hardware Grade

16 in., per doz.....*$2.25@2.50*
17 in., per doz.....*$2.50@2.75*
18 in., per doz.....*$2.75@3.00*

Rings and Ringers—Bull Rings—

	2	*2½*	*3 Inch*
Steel.....	*$0.70*	*0.75*	*0.80 doz*
Copper.....	*1.00*	*1.15*	*1.40 doz*

Hog Rings and Ringers—

Hill's Rings....gro. boxes, $4.25@4.50
Hill's Ringers, Gray Iron. doz. 50@55c
Hill's Ringers, Mal. Iron, doz. 70@75c
Blair's Rings.....per gro. $5.00@5.25
Blair's Ringers...per doz. $0.60@ .65
Brown's Rings....per gro. $5.25@5.50
Brown's Ringers..per doz. $0.65@ .70

Rivets and Burrs—

Copper.....*60@60c&5%*
Iron or Steel.....*75c&5@75c&10%*

Rollers—

Acme, Stowell's Anti-Friction.....50%
Barn Door, Sargent's list.....60%
Cronk's Stay.....60&5%
Cronk's Brinkerhoff.....60&5%
Lane's Stay .....33⅓&5%
Stowell's Barn Door Stay.....₱ doz. $1.00

Rope—

Manila, 7-16 in. diam. and larger, tarred or untarred.....*lb.* .. *@12 c*
Manila, Hay, Hide and Bale Ropes, Medium and Coarse.....*lb.* .. *@12 c*
Sisal, 7-16 in. diam. and larger:
Mixed.....*lb.* .. *@ 8 c*
Pure.....*lb.* .. *@ 9¼c*
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Mixed.....*lb.* .. *@ 8 c*
Pure.....*lb.* .. *@ 9¼c*
Sisal, Tarred, Medium Lath Yarn:
Mixed.....*lb.* .. *@ 7½c*
Pure.....*lb.* .. *@ 8¼c*
Cotton Rope: —*Lb.*—
Best.....*¼-in. and larger*..*18@25c*
Medium..¼-in. and larger..*16@18c*
Com.....*¼-in. and larger*..*12@13c*
Jute Rope:
Thread No. 1, ¼-in. and up, lb. 6 c
Thread No. 2, ¼-in. and up, lb. 5½c
Old Colony Manila Transmission Rope, ₱ ℔ 17½¢

Wire Rope—

Galvanized.....*.57½&5%*
Plain.....*55&5%*

Ropes, Hammocks—

Covert Mfg. Co.:
Jute.....40&5%
Sisal.....20%
Covert Saddlery Works.....60&5%

Rules—

Boxwood.....*60&10@60&10&5%*
Ivory.....*35&10@35&10&5%*
Chapin-Stephens Co.:
Boxwood.....60@60&10%
Ivory.....35@35&10&10%
Miscellaneous.....30@30&10&10%
Combination.....55@55&10%
Stationers'.....10@10&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....60&10%
Stanley R. & L. Co.:
Boxwood.....60@60&10%
Ivory.....35@35&10&10%
Upson Nut Co.:
Boxwood.....60@60&10%
Ivory.....35&10@35&10&10%

Sash Locks—See *Locks, Sash*

Sash Weights—See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers, Sausage.*

Saw Frames—See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins:
Circular.....50%
Band.....50&10@60%
Cross Cuts.....35&5%
Mulay, Mill and Drag.....50%
One-Man Saw.....40%
Wood Saws.....40%
Hand, Compass, &c.....40%
Chapin-Stephens Co.:
Turning Saws and Frames....30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....30&10&5%
Disston's:
Circular, Solid and Inserted Tooth..50%
Band, 3 to 14 in. wide.....60%
Band, ¼ to 2¾.....70%
Crosscuts.....45%
Narrow Crosscuts.....50%
Mulay, Mill and Drag.....50%
Framed Woodsaws.....35%
Woodsaw Blades.....35%
Woodsaw Rods.....35%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 7½, 77, 8.....25%
Hand Saws, Nos 7, 107, 107½, 3, 1, 0, 00, Combination.....30%
Compass, Keyhole, &c.....25%
Butcher Saws and Blades.....35%
C. E. Jennings & Co.'s.:
Back Saws.....35&10%
Butcher Saws.....30&10%
Compass and Key Hole Saws.35&5&10%
Framed Wood Saws.....30&10%
Hand Saws.....20&2½&10%
Wood Saw Blades.....30&10%
Millers Falls:
Butcher Saws.....15&10%
Star Saw Blades.....15&10%
Peace & Richardson's Hand Saws.....30%
Simonds':
Circular Saws.....50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws..30%
Band Saws.....50%
Back Saws.....25@25&7½%
Butcher Saws.....35@35&7½%
Hand Saws.....25@25&7½%
Hand Saws, Bay State Brand.....25%
Compass, Keyhole, &c .....25@25&7½%
Wood Saws.....35@35&7½%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws.....50%

Hack Saws—

Atkins' Hack Saw Blades A A A. ... 25%
Disston:
Concave Blades.....25%
Keystone.....40%
Hack Saw Frames.....30%
Fitchburg File Works, The Best.....25%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180.....
35&5&10%
Hack Saws, Nos. 175, 180, complete.....
35&5&10%
Goodell's Hack Saw Blades.....40%
Griffin's Hack Saw Frames .. 35&5&10%
Griffin's Hack Saw Blades.....35&5&10%
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades.....35%
Sterling Hack Saw Frames.....30&10&5%

Scroll—

Barnes' No. 7, $15.....35%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20.....30%
Lester, complete, $10.00.....15&10%
Rogers, complete, $4.00.....15&10%

Scalers, Fish—

Bishop's Lightning.....₱ doz. $2.00
Covert's Saddlery Works.....60&10%

Scales—

Family, Turnbull's.....*50@50&10%*
Counter:
Hatch, Platform, ½ oz to 8 lbs. doz. $5.50
Two Platforms, ½ oz to 8 lbs, doz. $16
Union Platform, Plain..$1.70@1.90
Union Platform, Striped $1.85@2.15
Chatillon's:
Eureka.....25%
Favorite.....40%
Grocers' Trip Scales.....50%
Chicago Scale Co.:
The "Little Detective," 25 lbs.....50%
Union or Family No. 2.....60%
Portable Platform (reduced list).....50%
Wagon or Stock (reduced list)...25&35%
Pelouze Scales—Household, Counter, Candy, Ice, Postal, Computing.....50%
"The Standard" Portables.....50%
"The Standard" R. R. and Wagon.....50%

Scrapers—

Box, 1 Handle.....*doz. $1.00@2.25*
Box, 2 Handle.....*doz. $2.60@2.85*
Ship Light, $2.00; Heavy, $4.50
Adjustable Box Scraper (S. R. & L. Co) $6.00.....30@30&10%
Chapin-Stephens Co., Box.....50@50&10%

Screens, Window, and Frames—

Flyer Pattern Screens...60&5@60&5&2½%
Maine Screen Frames.....40&10&5%
Perfection Screens.....60&5@60&5&2½%
Phillips' Screen Frames..60&5@60&5&2½%
Porter's:
Fairview Screens.....60&5@60&5&2½%
Hummer Screens.....60&5@60&5&2½%
Klondike Screens.....60&5@60&5&2½%
See also *Doors.*

Screws—Bench and Hand—

Bench, Iron..doz. 1 in.. $2.50@3.75 ; 1¼, $3.00@3.75
Bench, Wood Beech....doz. 30@30&5
Hand, Wood.....30@30&5%
R. Bliss Mfg. Co, Hand.....30%
Chapin-Stephens Co., Hand.....30&30&10%

Coach, Lag and Hand Rail—

Lag, Common Point, list Oct. 1, '99.....80&5%
Coach and Lag, Gimlet Point, list Oct. 1, '99.....80%
Hand Rail, list Jan. 1, '81..70&10@75%

Jack Screws—

Standard List.....75&10@80&5%
Millers Falls.....50&10&10%
Millers Falls, Roller.....50&10%
P., S. & W.....50@50&5%
Sargent.....70%

Machine—

List Jan. 1, '98.
Flat or Round Head, Iron..50@50&10%
Flat or Round Head, Brass 50@50&1%

Set and Cap—

Set (Iron or Steel) 70&10&5% } *Extra*
Sq. Hd. Cap.....65&10&5% } *10&10*
Hex. Hd. Cap.....65&10&5% } *often*
Rd. or Fillister Hd. Cap 60% } *given.*

Wood—

List July 23, 1903.
Manufacturers' printed discounts :
Flat Head, Iron.....87½&10@...%
Round Head, Iron.....85&10@...%
Flat Head, Brass.....85&10@...%
Round Head, Brass.....80&10@...%
Flat Head, Bronze....77½&10@...%
Round Head, Bronze.....75&10@...%
Drive Screws.....87½&10%

Scroll Saws—See *Saws, Scroll.*

Scythes—

Per doz.
Clipper Pattern, Grass...$4.25@$5.00
Full Polished Clipper.....$5.75@$5.50
Grain.....$7.00@$7.50
Clipper, Grain.....$7.75@$8.25
Weed and Bush.....$4.50@$5.00

Seeders—Raisin—

Enterprise.....25@30%

Sets—Awl and Tool—

Brad Awl and Tool Sets :
Wood Hdle., 10 Awls doz. $2.00@2.25
Wood Hdle., 14 Awls, 6 Tools doz. $2.50@2.60
Aiken's Sets, Awl and Tools :
No. 20, ₱ doz. $10.00.....50&10&10%
Fray's Adj. Tool H'dls...Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
C. E. Jennings & Co.'s Model Tool Holders.....30&10%
Millers Falls Adj. Tool H'dls, No. 1, $12; No. 4, $12; No. 5, $18 .... 15&10%
Stanley's Excelsior :
No. 1, $7.50 ; No. 2 $4.00; No. 3, $6.50.....30@30&10&10%

Garden Tool Sets—

Ft. Madison, Three Prongs, Hoe, Rake and Shovel.....₱ doz. sets.....$9.00

Nail—

Square.....per gro. $2.25@2.50
Round, Blk. and Pol., assorted..... gro. $1.80@2.00
Octagon.....gro. $1.50@3.75
Buck Brothers.....27½%
Cannon's Diamond Point, ₱ gr. $12..25%
Mayhew's.....per gro. $9.00
Snell's Corrugated, Cup Pt. per gro. $7.50
Snell's Knurled, Cup Pt....per gro $7.50

Rivet—

Regular list.....70&10@75%

Saw—

Aiken's:
Genuine.....50&10%
Imitation.....50&10%
Atkin's.:
Criterion.....40%
Adjustable.....40%
Bemis & Call Co's.:
Cross Cut.....30%
Hammer, new Pat.....45%
Plate.....30%
Spring Hammer.....30%
Disston's Star and Monarch.....25%
Morrill's No. 1, $15.00.....50%
Nos. 3 and 4, Cross Cut, $20.63.....50%
No. 5, Mill, $30.00.....50%
Nos. 10, 11, 98, $15.63.....50%
No. 1 Old Style, $10.00.....50%
Special, $16.25.....50%
Giant Royal, Cross Cut .....₱ doz. $8.50
Royal, Hand.....₱ doz. $5.00
Talntor Positive.....₱ doz $6.75

Shaving—

Fox Shaving Sets, No. 30, per doz, $24.00net

Sharpeners, Knife—

Chicago Wheel & Mfg. Co.....65%

Shaves Spoke—

Iron.....doz. $1.00@1.15
Wood.....doz. $1.75@2.00
Bailey's (Stanley R. & L. Co.).....20@30&10&10%
Chapin-Stephens Co .....30&30&10&10%
Goodell's, ₱ doz. $9.00.....15&10%
Wood's F1 and F2.....50%

Shears—

Cast Iron...	*7*	*8*	*9 in.*
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*$13.00*	*15.00*	*17.00 gro.*
Cheap	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality, Jap.....70@70&10%
" Nickel.....60@60&10%
Fair qual. Jap.....80@80&5%
" Nickel.....75@75&10%
Tailors' Shears.....60@60&10%
Acme Cast Shears.....40@40&5%
Heinisch's Tailors' Shears.....10%
Wilkinson's Hedge.....1900 list 45%
Wilkinson's Branch, Lawn and Border.....40%
Wilkinson's Sheep.....1900 list. 50%

Tinners' Snips—

Steel Blades.....80&5@80&10
Steel Laid Blades.....40&10@50%
Forged Handles, Steel Blades, Berlin.....40@40&10%
Heinisch's Snips.....40%
Jennings & Griffin Mfg. Co.'s, 6¼ to 10 inch.....40&7½&10%
Niagara Snips.....40%
P., S & W. Co.....20%
Triumph Pipe Shear.....₱ doz. 9.00

Pruning Shears and Tools—

Cronk's Grape Shears.....33⅓%
Cronk's Pruning Shears.....33⅓%
Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00.....25%
Disston's Pruning Hook, ₱ doz. $12.00 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades....40@40&5%
Orange Shears.....50&10@50&20%
Grape.....40&10@50%
Tree Pruners.....75%
P., S. & W. Co.....33⅓%

Sheaves—Sliding Door—

Stowell's Anti-Friction.....50%
Patent Roller Hatfield's, Sargent's list, 70&10%
Reading.....50%
R. & E. list.....33⅓%
Wrightsville Hatfield Pattern.....50%

Sliding Shutter—

Reading list.....50%
R. & E. list.....33⅓%
Sargent's list.....50&10%

Shells—Shells, Empty—

Brass Shells, Empty :
First quality, all gauges.....60&5%
Climax, Club Rival, 10 and 12 gauge, 65&5%
Paper Shells, Empty :
Acme, Ideal, Leader, New Rapid, Magic 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge.....20%
Climax, Union, League, New Rival 10 and 12 gauge.....25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge ($7.50 list)..20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge.....33⅓&5%
Robin Hood, Low Brass.....20&10%
Robin Hood, High Brass.....50&10%

Shells, Loaded—

Loaded with Black Powder 40%
Loaded with Smokeless Powder, medium grade.....40&5%
Loaded with Smokeless Powder, high grade.....40&10&10%
Robin Hood Smokeless Powder:
Robin Hood, Low Brass.....50%
Comets, High Brass.....50&10&5%

Shoes Horse, Mule, &c.—

F. o. b., Pittsburg;
Iron.....per keg $3.85
Steel.....per keg 3.60
Burden's, all sizes, ₱ keg.....$3.90

Shot—

Drop, up to B, 25-lb. bag.....$1.60
Drop, B and larger, per 25-lb. bag $1.85
Buck, 25-lb. bag.....$1.85
Chilled, 25-lb. bag.....$1.85

Shovels and Spades—

Association List, Nov. 15, 1902....40%

Sieves and Sifters—

Hunter's Imitation, gro. $10.50@11.00
Buffalo Metallic Inlaid. S. S. Co., ₱ gr.:

14&16	16&18	18&20
$13.20	$13.50	$14.40

National Mfg. Co.:
Victor.....per gro. $12.00
Surprise.....per gro. $11.00
No Name.....per gro. $11 00
Shaker (Barlers Pat.) Flour Sifters, ₱ doz., $2.00.....20%

Sieves, Tin Rim—

Per dozen.

Mesh	*15*	*16*	*18*	*20*
Black, full size	*$1.20*	*1.25*	*1.30*	*1.35*
Plated, full size	*$1.30*	*1.35*	*1.40*	*1.45*
Black, scant		*$0.95*	*1.00*	*1.05*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested, doz.....$0.90@0.95
Mesh 20, Nested, doz..... 1.00@1.05
Mesh 24, Nested, doz..... 1.30@1.40

Sinks—

Cast Iron—

Standard list .....60@60&10%
NOTE.—*There is not entire uniformity lists used by jobbers.*

Skeins Wagon—

Cast Iron.....75@75&10%
Steel.....40@40&10%

Slates, School—

Factory Shipments.
"D" Slates.....40&10%
Noiseless Slates.....60&5 tens

Slaw Cutters—See *Cutters.*

Slicers, Vegetable—

Sterling No. 10, $2.00.....33⅓

Snaps, Harness—

German.....40@40&10%
Covert Mfg. Co.:
Deroy.....20&5&2%
High Grade.....45%
Jockey.....30&10%
Trojan.....45%
Yankee.....30&5&2%
Yankee, Roller.....30&5&2%
Covert's Saddlery Works:
Crown.....60%
German.....60%
Model.....60%
Triumph.....60%
Oneida Community Solid Swivel.....60%
Sargent's Patent Guarded .....66⅔&10%

Snaths—

Scythe.....45%

Snips, Tinners'—See *Shears*

Spoons and Forks—

Silver Plated—

Good Quality..... 50&10@60&5%
Cheap..... 60@60&10%
International Silver Co.
1847 Rogers Bros. and Rogers & Hamilton.....40&10%
Rogers & Bro., William Rogers Eagle Brand.....50&10%
Anchor, Rogers Brand.....60%
Wm. Rogers & Son.....60&10%
Simeon L. & Geo. H. Rogers Co.:
Silver Plated Flat Ware.....60%
No. 77 Silver Plated Ware.....60&10%

Miscellaneous—

German Silver..... 60@60&5%
Cattaraugus Cutlery Co.:
Yukon Silver.....50%
Simeon L. & Geo. H. Rogers Co.:
German or Nickel Silver, Special list 1..&10%

Tinned Iron—

Teas.....per gro. 45@50c
Tables.....per gro. 90c@$1.00

Springs—Door—

Chicago (Coil).....40&10%
Gem (Coil).....20%
Reliance (Coil).....40&10%
Star (Coil).....30%
Torrey's Rod, 30 in.....₱ doz. $1.10
Victor (Coil).....50&10&10%

Carriage, Wagon, &c.

1¼ in. and Wider :
Black or ¼ Bright, lb.....4¾@5 c
Bright, lb. .....6¼@6½c
Painted Seat Springs :
1½ x 2 x 26, per pr.....50@55c
1½ x 2 x 28 per pr.....60@65c
1½ x 3 x 28 and narrower, per pr. 80@85c

Sprinklers, Lawn—

Enterprise.....25@30%
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 3, $24.....30%

Squares—

Nickel plated.... } *List Jan. 5, 1900.*
Steel and Iron... } *70&10@70&10&10%*
Rosewood Hdl Try Square and T-Bevels .....60&10&10@70%
Iron Hdl. Try Squares and T-Bevels. 40&10@40&10&10%
Disston's Try Sq. and T-Bevels.....70%
Winterbottom's Try and Miter..... 40&10@40&10&10%

Squeezers—Lemon—

Wood, Common, gro., No. 0, $5.25 @$5.50 : No. 1, $6.25@$6.50.
Wood, Porcelain Lined.
Cheap.....doz. $1.00
Good Grade.....doz. $1.25
Tinned Iron.....doz. $0.75@1.25
Iron, Porcelain Lined.....doz. $1.75

Staples—

Barbed Blind. .....lb. 6@6½c
Electricians', Association list..... 80&10&10&10%
Fence Staples, Plain $2.25; Galvanized.....$2.55
Poultry Netting, Staples....per lb.. 3¼@3½c
Grand Crossing Tack Co.'s list...80&10%

Steels, Butchers'—

Dick's.....80%
Foster Bros'.....80%
C. & A. Hoffmann's.....40%

Steelyards..... .....30@30&10%

Stocks and Dies—

Blacksmiths'.....40&10@50%
Curtis Reversible Ratchet Die Stock.25%
Derby Screw Plates.....25%
Gardner Die Stocks No. 1.....50%
Gardner Die Stocks, larger sizes.....40%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25@30%

Stone—

Scythe Stones—

Chicago Wheel & Mfg. Co:
Gem Corundum, 10 inch, $8.00 per gro., 12 inch, $10.80
Norton Emery Scythe Stones:
Less than gross lots.....₱ gro. $9.00
One gross or more.....₱ gro. $7.20
Lots of 10 gross or more....₱ gro $6.00
Pike Mfg. Co. 1901 list:
Black Diamond S. S....₱ gro. $12.00
Lamoille S. S .....₱ gro. $11.00
White Mountain S. S.....₱ gro. $9.00
Green Mountain S. S. .....₱ gro. $6.00
xtra Indian Pond S. S. ₱ gro. $7.50
No. 1 Indian Pond S. S..₱ gro. $7.00
No. 2 Indian Pond S. S..₱ gro. $4.50
Leader Red End S. S....₱ gro $4.50
Balance of 1901 list 33⅓%
40%

Oil Stones, &c.

Chicago Wheel & Mfg. Co., 1901 list:
Gem Corundum Oil, Double Grit....50%
Gem Corundum Axe, Single or Double Grit.....55%
Gem Corundum Slips.....50%
Gem Corundum Razor Hones.....50%
Pike Mfg. Co. 1901 list:

	₱ lb.
Arkansas Stone, No. 1, 3 to 5½ in.	$2.80
Arkansas Stone, No. 1, 5½ to 8 in.	$3.50
Arkansas Slips No. 1	$4.00
Lily White Washita 4 to 8 in.	60¢
Rosy Red Washita, 4 to 8 in	60¢
Washita Stone, Extra, 4 to 8 in.	50¢
Washita Stone, No. 1, 4 to 8 in.	40¢
Washita Stone, No. 2, 4 to 8 in.	30¢
Lily White Slips	90¢
Rosy Red Slips	90¢
Washita Slips, Extra	80¢
Washita Slips, No. 1	70¢
India Oil Stones (entire list)	33⅓%

50&10%

Hindostan No. 1, Regular.....₱ lb 8¢
Hindostan No. 1 Small.....₱ lb 10¢
Axe Stones (all kinds).....
Turkey Oil Stones, ex. 5 to 8 in. ₱ lb 50¢
Queer Creek Stones, 4 to 8 in.....20¢
Queer Creek Slips.....40¢
Sand Stone.....5¢
Belgian, German and Swaty Razor Hones.....50%
Natural Grit Carving Knife Hones, ₱ doz.....$3.00
Quick Edge Pocket Knife Hones, ₱ doz.....$2.00
Mounted Kitchen Sand Stone, ₱ doz.....$1.50

40%

Stoners—Cherry—

Enterprise.....25@30%

Stops, Bench—

Millers Falls.....15&10%
Morrill's...₱ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50..... .....50%
Whipple's Combination..... ₱ doz. $2 50

Door—

Chapin-Stephens Co.....60@60&10%

Plane—

Chapin-Stephens Co.....20%

Straps—Box—

Cary's Universal, case lots....20&10&10%

Hame—

Covert's Saddlery Works.....60&10%

Stretchers, Carpet—

Cast Iron, Steel Points....doz. 55@60c
Socket.....doz. $1.75
Excelsior Stretcher and Tack Hammer Combined, per doz. $6.... .....30%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Mfg. Co., list Jan. 1, 1902.....30&5%

Sweepers, Carpet—

National Sweeper Co.: Per doz.
Auditorium, Roller Bearing (26 in case), Nickel.....$54.00
Mammoth, Roller Bearing (30 in case), Nickel.....$60.00
Marion, Roller Bearing, regular finishes, full Nickel.....$24.00
Marion Queen, Roller Bearing, full Nickel.....$24.00
Monarch, Roller Bearing, Nickel..$22.00
Monarch, Roller Bearing, Jap'ned.$20.00
Transparent, Roller Bearing, Plate Glass Top, Nickel.....$36.00
Monarch Extra, Roller Bearing, (17-inch case), Nickel.....$36.00
Monarch Extra, Roller Bearing (17-inch case), Japanned.....$35.00
National Queen, Fancy Veneers...$27.00
Perpetual, Regular Bearings, Nkl.$20.00
Perpetual, Regular Bearings, Jap.$18.00
NOTE.—*Rebates:* 30c *per dozen on three-dozen lots ;* $1 *per dozen on five-dozen lots ;* $2 *per dozen on ten-dozen lots;* $2.50 *per dozen on twenty-five-dozen lots.*

Tacks, Brads, &c.—

List Jan. 15, '99.
Carpet Tacks.....90&40&10@....%
American Cut Tacks....90&25@....%
Swedes Iron Tacks.90&30&10&5@....%
Swedes Upholsterers' Tacks..... 90&45&10&5@....%
Gimp Tacks.....90&45&10@....%
Lace Tacks.....90&45&10@....%
Trimmers' Tacks..90&30&10&5@....%
Looking Glass Tacks..70&10&5@....%
Bill Posters' and Railroad Tacks..... 90&45&10....%
Hungarian Nails ....80&30&5@....%
Common and Patent Brads..... 80&10&5@....%
Trunk and Clout Nails..80&10@....%
NOTE.—*The above prices are for Straight Weights.* An extra 5% is given Star Weights** and an extra 10&5% on Standard Weights.****

Miscellaneous—

Double Pointed Tacks...90 and 6 tens
Steel Wire Brads, R. & E. Mfg. Co 's list.. 50&10&60%

See also *Nails, Wire.*

Tanks, Oil—

	Each.
Emerald, S. S. & Co.....30-gal	$3.25
Emerald, S. S. & Co.....60-gal.	$4.00
Queen City S. S. & Co., 30-gal.....	$3.65
Queen City S. S. & Co., 60-gal.....	$4.50

Tapes, Measuring—

American Asses' Skin.....40&10@50%
Patent Leather.....25@30&5%
Steel..... .....40@40&10%
Chesterman's.....25@25&5%
Eddy Asses' Skin.....40&10@50%
Eddy Patent Leather.....25&30&5%
Eddy Steel.....40@40&10%
Keuffel & Esser Co., Steel and Metallic, Lower list, 1899..... .....35%
Lufkin's Steel.....33⅓&35%
Lufkin's Metallic.....30@30&5%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger, per 100 lbs..$3.00

Thermometers—

Tin Case.....80&10@80&10&5%

Ties, Bale—Steel Wire.

Single Loop..... .....80@2¼
Monitor, Cross Head, Etc.....70%

Brick Ties—

Niagara Brick Ties.....30&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works.....60&10%

Tire Benders, Upsetters, &c.—

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White ..... 20@20&5%

Hay—

Myers' Hay Tools 50%
Stowell's Hay Carriers 5%
Stowell's Hay Forks 50%
Stowell's Fork Pulleys 50%

Saw—

Atkins' Cross Cut Saw Tools 40%
Simonds' Improved 33⅓%
Simonds' Crescent 25%

Ship—

L. & I. J. White 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme ..... doz. $1.15@1.25 ; gro. $11.50@12.00
Harper, Champion or Paragon ..... doz. $1.25@1.40 : gro. $13.00@13.50

Game—

Oneida Pattern ..... 75&10@75&10&5%
Newmouse ..... 45@45&5%
Hawley & Norton ..... 65@65&5%
Victor (Oneida Pattern) ..... 75@75&5%
O.C. Jump (Blake Pattern) 60&5@60&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes ..... 8½@9c
Mouse, Round or Square Wire ..... doz. 85@90c
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, Each $1.12½ ; ℔ doz. $12.00
No. 3, Rat, ℔ doz. $.6.00; case of 50 $5.25 doz.
No. 3½, Rat, ℔ doz. $4.75; case of 72 $4.25doz.
No. 4, Mouse, ℔ doz. $3.50; case of 7 $2.75 doz.
No. 5, Mouse, ℔ doz. $2.75; case of 150 $2.25
Schuyler's Rat Killer, No. 1, ℔ gr. $30.00
No. 2, ℔ gr. $20.00; Mouse, No. 3, $18.00 ..... 50%
J. M Mast Mfg. Co.: Per gro.
Mouse. Rat.
Blizzard ..... No. 12, $3.00 No. 1, $9 50
Old Nick ..... No. 30, 2.22 No. 2, 8.40
Joker ..... No. 5, 2.10 No. 3, 8.40
Imp'd Snap Shot, Mouse, per gro., 2 hole, $2.40.
Imp'd Snap Shot, Mouse, per gro., 4 hole, $4.20.

Trimmers Spoke—

Bonney's Nos. 1 and 2 ..... 33⅓%
Wood's E 1 ..... 50%

Trowels—

Disston Brick and Pointing 30%
Disston Plastering 25%
Disston "Standard Brand" and Garden Trowels 35%
Kohler's Steel Garden Trowels, 5 in. ℔ gro. $5.00
Kohler's Steel Garden Trowels, 6 in. ℔ gro. $6.00
Never-Break Steel Garden Trowels ..... gro. $6.00
Rose Brick and Plastering ..... 25&5%
Woodrough & McParlin, Plastering .. 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern ..... 50&10%
Western Pattern ..... 60&10%
Handy Trucks ..... per doz. $16.00
Grocery ..... per doz. $15.00
Daisy Stove Trucks, Improved pattern ℔ doz. $18.50
Model Stove Trucks ..... ℔ doz. $18.50

T-bs, Wash—

	No. 1	2	3
Galvanized, per doz.	*$5.00*	*5.50*	*6.25*
Galvanized Wash Tubs (S. S. & Co.):			
No.	1	2	3
Per doz., net	$5.70	6.50	7.20
	6.30	7.20	8.10

Twine—Miscellaneous—

Flax Twine—	*BC.*	*B.*
No. 9, ¼ and ⅛-lb. Balls	*..23c@24c*	
No. 12, ¼ and ½ lb. balls	*..18c@20c*	
No. 18, ¼ and ½-lb. Balls	*..16c@18c*	
No. 24, ¼ and ½-lb. Balls	*..16c@18c*	
No. 36, ¼ and ½-lb. Balls	*..15c@17c*	

Chalk Line, Cotton, ½-lb Balls ..... doz

Cotton Mops, 6, 9, 12 and 15 lb. to doz ..... 10@12c
Cotton Wrapping 5 Balls to lb ... according to quality ..... 16c@25c
American 2-Ply Hemp, ¼ and ⅛-lb. Balls ..... 13@14c
American 3 Ply Hemp, 1-lb. Balls .. 13@14c
India 2-Ply Hemp, ¼ and ⅛-lb. Balls (Spring Twine) 9c
India 3-Ply Hemp, 1-lb. Balls 9c
India 3-Ply Hemp, 1¼-lb. Balls .. .8c
2, 3, 4 and 5-Ply Jute, ½-lb. Balls... 9@10c
Mason Line, Linen, ½-lb. Balls ...46c
No. 20½ Mattress, ¼ and ⅛-lb Balls.37c
Wool, 3 to 6 ply ..... 5¾@6c

Vises—

Solid Box ..... 50&10@60%

Parallel—

Athol Machine Co :
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Bonney's 33⅓%
Columbian Hdw. Co 40%
Emmert Universal:
Pattern Makers' No. 1 ..... $15.00
Pattern Makers' No. 2 ..... $12.50
Machinist and Tool Makers' No. 4. $12.50
Fisher & Norris Double Screw ....15&10%
Hollands':
Machinists' ..... 40@40&5%
Keystone ..... 65&5@70%
Lewis Tool Co ..... 20@30%
Merrill's 20%
Miller's Falls ..... 60&10%
Massey Vise Co.:
Clincher 40%
Perfect 20%
Lightning Grip 20%
Parker's:
Victor ..... 20@25%
Regulars ..... 20@25%
Vulcan's ..... 40@45%
Combination Pipe ..... 55@60%
Prentiss ..... 20@25%
Sargent's 40%
Smith & Hemenway Co.:
Machinists 40%
Jewelers 33⅓%
Snediker's X. L 33⅓%
Stephens' 33⅓%

Saw Filers'—

Bonney's, No. 1, $13; No. 3, $16 ....40%
Disston's D 3 Clamp and Guide, ℔ doz. $30 ..... 25%
Perfection Saw Clamps, ℔ doz. $3.00
Reading 60%
Wentworth's Rubber Jaw, Nos. 1 and 2 ..... 45&50%

Wood Workers'—

Massey Vise Co.:
Lightning Grip 15%
Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00 ; 9 in., $7.00 ; 14 in., $8.00.

Miscellaneous—

Bignall & Keeler Combination Pipe Vise 60%
Hollands' Combination Pipe ....60@60&5%
Massey's Quick Action Pipe 40%
Parker's Combination Pipe:
87 Series 60%
187 Series ..... 60&5%
No. 870 ..... 40%

Wads—Price Per M.

Dis. 15%

B E., 11 up	*60c*
B. E., 9 and 10	*70c*
B. E., 8	*80c*
B. E., 7	*80c*
P. E., 11 up	*$1.00*
P. E., 9 and 10	*1.25*
P. E., 8	*1.50*
P. E., 7	*1.50*
Ely's B. E., 11 and larger	*$1.70@1.75*
Ely's P E., 12 to 20	*$3.00@3.25*

Ware Hollow—Cast Iron, Hollow—

Stove Hollow Ware :
Enameled ..... 55&10@60%
Ground ..... 60&10@65%
Plain or Unground ..... 65&10@70%
Country Hollowware per 100 lbs., $2 50
White Enameled Ware :
Maslin Kettles 70%
Covered Ware :
Tinned and Turned 50%
Enameled 50%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware ..... 50&20
Agate Nickel Steel Ware, Specials ..... 60&15%
Iron Clad Ware ..... 70&10%
Lava, Enameled ..... 40&10%
Never Break Enameled 50%

Tea Kettles—

Galvanized Tea Kettles :

Inch	*6*	*7*	*8*	*9*
Each	*.45c*	*50c*	*55c*	*65c*

Steel Hollow Ware.

Avery Spiders & Griddles ..... 65@65&5%
Avery Kettles 60%
Porcelained ..... 50&5@50&10%
Never Break Spiders and Griddles ..... 65&5%
Never Break Kettles 60%
Solid Steel Spiders & Griddles. ....65&5%
Solid Steel Kettles 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone ..... 40@40&10%

Washboards—

Solid Zinc: ℔ doz
Crescent, family size, bent frame. $3.00
Red Star, family size, stationary protector $3.00
Double Zinc Surface :
Saginaw Globe, family size, stationary protector $2.65
Cable Cross, family size, stationary protector $2.90
Single Zinc Surface :
Salad, family size, open back perforated $2.40
Saginaw Globe, protector, family size, ventilated back $2.25
Brass Surface:
Brass King, Single Surface, open back $3.00
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.00

Washers—Leather, Axle—

Solid ..... 80&10@80&10&10%
Patent ..... 90@90&5%
Coil: ⅞ 1 1⅛ 1¼ *Inch.*
11c 12c 13c 14c per box

Iron or Steel—

Size bolt .... 5-16 ⅜ ½ ⅝ ¾
Washers $5.10 4.20 2.90 2.70 2.50
In lots less than one keg add ½c per lb., 5-lb. boxes add ½c to list.

Cast Washers—

Over ½ inch. barrel lots. per lb 1¾@2c

Waterers, Hog—

Improved Dewey. ℔ doz $13.00

Wedges—

Oil Finish ..... lb. 2.35@2.40c

Weights—Hitching—

Covert Mfg. Co ..... 40&2%
Covert's Saddlery Works ..... 60&10%

Sash—

Per ton, f.o.b. factory :
Eastern District $25.00
Western, Central and Southern Districts market unsettled, prices ranging from $21.00@25.00

Wheels, Well—

8-in., $1.60@1.80: 10-in., $2.00@2.25; 12-in., $2.45@2.65; 14-in., $4.00@4.25

Wire and Wire Goods—

Bright and Annealed :

6 to 9	*75@75&10%*
10 to 18	*75&5@75&10&5%*
19 to 26	*75&10@10@80&5%*
27 to 36	*75&10&7½@80&2½%*

Galvanized :

6 to 9	*70&5@70&10%*
10 to 18	*70&5@70&10%*
19 to 26	*72½@72½&5%*
27 to 36	*70@70&5%*

Coppered :

6 to 9	*70&5@70&10%*
10 to 18	*70&10@70&10&5%*
19 to 26	*72½&10@10&75%*
27 to 36	*70@70&5%*

Tinned :

6 to 14	*72½&10@75%*
15 to 18	*70&10@70&10&5%*
19 to 26	*65&10&10@70%*
27 to 36	*60@60&10%*

Annealed, Steel and Tinned, on Spools ..... 70@70&10%
Brass & Copper on Spools 60@60&10%
Brass, list Feb. 26, '96 ..... 30%
Copper, list Feb. 26, '96 ..... 15%
Cast Steel Wire 50%
Wire Clothes Line, see *Lines.*
Wire Picture Cord, see *Cord.*

Bright Wire Goods—

List June 24, 1903 ..... 90@90&10%

Wire Cloth and Netting—

Galvanized Wire Netting ..... 80&10@80&10&5%
Painted Screen Cloth, per 100 ft. $1.25
Standard Galv. Hardware Grade :
Nos. 2, 2½ and 3 Mesh, sq. ft. 2c
Nos. 4 and 5 Mesh, sq. ft. 3½c
No. 6 Mesh, sq ft 3½c
No. 8 Mesh, sq ft 4c

Wire Barb—See *Trade Report.*

Wrenches—

Agricultural ..... 80&5@80&10&5%
Baxter Pat'rn S Wrenches ..... 70&5@70&10%
Drop Forged S ..... 45@45&5%
Acme ..... 60&10%
Alligator 70%
Alligator Pattern 70%
Bull Dog 70%
Bemis & Call's:
Adjustable S ..... 35&5%
Adjustable S Pipe 40%
Brigg's Pattern ..... 30&10%
Combination Black ..... 40&5%
Combination Bright 40%
Merrick's Pattern 50%
No. 3 Pipe, Bright 55%
Boardman's 33⅓%
Coes' Genuine Knife Hdl. ....40&10&5&5%
Coes' Genuine Steel Hdl. ....40&10&5&5%
Coes' Genuine Key Model ....40&10&5&5%
Coes' "Mechanics' ..... 40&10&10&5&5%
Donohue's Engineer ..... 40&10%
Dudly Combination ..... 50&10&5%
Dudly Pipe ..... 50&10&5%
Dudly Adjustable Pipe ..... 40&10&5%
Eagle ..... 50&10%
Elgin Wrenches 40%
Elgin Monkey Wrench Pipe Jaws 33⅓%
Gem Pocket 30%
Hercules 70%
W. & B. Machinists:
Case lots ..... 50&5%
Less than case lots 50%
Improved Pipe (W & B.) 60%
Solid Handles, P.S. & W ..... 50@50&5%
Stillson 65%
Triumph ..... 60&10%
Vulcan Chain 50%

Fruit Jar—

T & B Fruit Jar Wrenches ..... ℔ gro $9.00
Triumph Fruit Can Wrenches, ℔ gro $9.60
Triumph Fruit Jar Holders .. ℔ gro. $15.00

Wrought Goods—

Staples, Hooks, &c., list March 17 '92 ..... 90@90&5%

Yokes, Neck—

Covert Saddlery Works, Trimmed 70%
Covert Saddlery Works, Neck Yoke Centers 70%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers & Freighters' .. list net

Zinc—

Sheet ..... per 100 lbs. $6.15@6.40

PAINTS, OILS AND COLORS.

White Lead, Zinc, &c.

Lead, English white, in Oil ..... 8½@ 9½
Lead, American White, in Oil:
Lots of 500 ℔ or over ..... @ 6¼
Lots less than 500 ℔ ..... @ 7
In Barrels ..... @ 6
Lead, White, in oil, 25 ℔ tin pails, add to keg price ..... @ ⅛
Lead, White, in oil, 12½ ℔ tin pails, add to keg price ..... @ 1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price. .. @ 1½
Lead, American, Terms: For lots 12 tons and over ½¢ rebate ; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice; for lots of less than 500 lbs. net.
Lead White, Dry in bbls. ..... @ 6
Zinc, American, dry ..... ℔ 4½@ 4¾
Zinc, Paris, Red Seal, dry ..... @ 8½
Zinc, Paris, Green Seal, dry .... @ 9¼
Zinc, Antwerp Red Seal, dry .... @ 6¾
Zinc, Antwerp, Green seal, dry .. @ 8¼
Zinc, V. M. French, in Poppy Oil, Green Seal:
Lots of 1 ton and over ..... 12 @12¼
Lots of less than 1 ton ..... 12¼@12¾
Zinc, V. M. French, in Poppy Oil, Red Seal:
Lots of 1 ton and over ..... 10¾@11¼
Lots of less than 1 ton ..... 11@11½
DISCOUNTS.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors.

Black, Carbon ..... ℔ 5 @10
Black, Drop, Amer ..... 4 @ 6
Black, Drop, Eng ..... 5 @15
Black, Ivory ..... 16 @20
Lamp, Com ..... 4½@ 6
Blue, Celestial ..... ℔ 4 @ 6
Blue, Chinese ..... 29 @32
Blue, Prussian ..... 27 @30
Blue, Ultramarine ..... 4½@15
Brown, Spanish ..... ½@ 1
Carmine, No. 40 ..... ℔ 3.50@3.75
Green, Chrome, ordinary ..... 3½@ 6
Green, Chrome, pure ..... 17 @25
Lead, Red, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over ..... @ 6¼
Lots less than 500 ℔ ..... @ 7
Litharge, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over ..... @ 6¼
Lots less than 500 ℔ ..... @ 7
Ocher, American ..... ℔ ton $3.50@16.00
Orcher, American Golden ..... 2½ @ 3
Orcher, French ..... 1½ @ 2½
Orcher, Foreign Golden ..... 3 @ 4
Orange Mineral, English ..℔ ℔ 9 @11
Orange Mineral, French .. ..10½@11¼
Orange Mineral, German ..... 8½@ 9
Orange Mineral, American .... 8 @ 8¼
Red, Indian, English ..... 4½@ 8¼
Red, Indian, American ..... 3 @ 3¼
Red, Turkey, English ..... 4 @ 6
Red, Tuscan, English ..... 7 @10
Red, Venetian, Amer.. ℔ 100 ℔ .$0.50@1.50
Red Venetian, English, ℔ 100 ℔ .1.25@1 75
Sienna, Italian, Burnt and Powdered ..... ℔ ℔ 3 @ 6½
Sienna, Ital., Raw, Powd ..... 3 @ 6½
Sienna, American, Raw ..... 1½@ 2
Sienna, American, Burnt and Powdered ..... ℔ ℔ 1½@ 2
Talc, French ..... ℔ ℔ 1 @ 1½
Talc, American ..... 75 @1.25
Terra Alba, French, ℔ 100 ℔ . 95 @1.00
Terra Alba, English ..... 95 @1.00
Terra Alba, American No. 1 ....85 @85
Terra Alba, American No. 2 ....45 @50
Umber, Turkey, Bnt. & Pow. ℔ ℔ 2½@ 3½
Umber, Turkey, Raw & Powd. 2½@ 3½
Umber, Bnt. Amer ..... 1½@ 2
Umber, Raw, Amer ..... 1½@ 2
Yellow, Chrome ..... 11 @14
Vermillion, American Lead ..... 10 @25
Vermillion, Quicksilver, bulk .. @70
Vermillion, Quicksilver, bags .. @71
Vermillion, English, Import .. .80 @85
Vermillion, Chinese .... .$0.90@1.00

Colors in Oil.

Black, Lampblack ..... 12 @14
Blue, Chinese ..... 36 @46
Blue, Prussian ..... 32 @36
Blue, Ultramarine ..... 13 @16
Brown, Vandyke ..... 11 @14
Green, Chrome ..... 10 @15
Green, Paris ..... @24
Sienna, Raw ..... 12 @15
Sienna, Burnt ..... 12 @15
Umber, Raw ..... 11 @14
Umber, Burnt ..... 11 @14

Miscellaneous.

Barytes, White Foreign, ℔ ton $17.50@20.00
Barytes Amer. floated ..... 18.50@20.00
Barytes, Crude, No. 1 ..... 10.00@11.00
Chalk, in bulk ..... ℔ ton 3.00@ 3.35
Chalk, in bbls ..... ℔ 100 ℔ .@ 35
China Clay, English .. ℔ ton 11.00@17.00
Cobalt, Oxide ..... ℔ 100 ℔ 2.50@ ...
Whiting, Common .℔ 100 ℔ .45@ .48
Whiting, Gilders ..... .55@ .57
Whiting, extra Gilders' .... .58@ .60

Putty.

In bladders ..... 13¼@2¼
In bulk ..... 1½@2
In cans 1 ℔ to 5 ℔ ..... 2½@4¼
In cans 12½ ℔ to 25 ℔ ..... 1½@2¼

Spirits Turpentine.

In Oil bbls ..... 58 @58½¢
In machine bbls ..... 58½@59 ¢

Glue.

Cabinet ..... ℔ ℔ 11 @15
Common Bone ..... 6 @ 8
Extra White ..... 18 @24
Foot Stock, White ..... 11 @14
Foot Stock, Brown ..... 7 @10
German Hides ..... 12 @18
French ..... 10 @40
Irish ..... 13 @16
Low Grade ..... 8 @11
Medium White ..... 14 @17

Gum Shellac—Cts. per lb.

Bleached, Commercial ..... 40 @45
Button ..... 45 @60
Diamond I ..... 60 @...
Fine Orange ..... 55 @58
A. C. Garnet ..... 45 @...
D. C ..... 90 @...
T. N ..... 47 @49
V. S. O ..... 62 @65

Animal, Fish and Vegetable Oils.

Linseed, City, raw ..... ℔ gal. .42 @43
Linseed, City, boiled ..... 44 @45
Linseed, State and West'n, raw 39 @40
Linseed, raw Calcutta seed ..... @65
Lard, Prime, Winter ..... 62 @63
Lard, Extra No. 1 ..... 52 @53
Lard, No. 2 ..... 40 @41
Cotton-seed, Crude, f.o.b mills. 28 @29
Cotton-seed, Summer Yellow, prime ..... 35 @35½
Cotton-seed Summer Yellow, off grades ..... 34½@35
Sperm, Crude ..... @55
Sperm, Natural Spring ..... 61 @62
Sperm, Bleached Spring ..... 63 @66
Sperm, Natural Winter ..... 65 @66
Sperm, Bleached Winter ..... 67 @68
Tallow, Prime ..... 49 @50
Whale, Crude ..... @...
Whale, Natural Winter ..... 46 @47
Whale Bleached Winter ..... 48 @49
Menhaden, Brown, Strained .. 31 @32
Menhaden, Light Strained ..... 32 @33
Menhaden, Bleached Winter .. 34 @35
Menhaden, Ex Bleached Winter 36 @37
Cocoanut, Ceylon ..... 6½@ 7
Cocoanut, Cochin ..... 7¼@ 7½
Cod, Domestic ..... 39 @40
Cod, Newfoundland ..... 40 @41
Red Elaine ..... 44 @45
Red Saponified ..... ℔ ℔ 5½@ 5¾
Olive, Italian, bbls ..... 50 @ 53
Neatsfoot prime ..... 54 @ ...
Palm, prime, Lagos ..... ℔ ℔ 6½@ 6¾

Mineral Oils.

Black, 20 gravity, 25@30 cold test ..... ℔ gal. 13 @14
Black, 29 gravity, 15 cold test. 14 @15
Black, Summer ..... 13 @14
Cylinder, light filtered ..... 20½@21½
Cylinder, dark filtered ..... 18½@19½
Paraffine, 903-907 gravity ..... 13 @15½
Paraffine, 903 gravity ..... 14 @14½
Paraffine, 885 gravity ..... 11¾@12½
Paraffine, red ..... 14 @15½
In small lots ½¢ advance.

CURRENT METAL PRICES.

MARCH 30, 1904.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Refined Iron:	
1 to 1¾ in. round and square, ₩ ℔	@1.80¢
1¼ to 4 in. x ⅜ to 1 in., ₩ ℔	@2.00¢
1¼ to 4 in. x ¼ to 5-16, ₩ ℔	@2.00¢
Rods—⅜ and 11-16 round and square, ₩ ℔	@2.00¢
Angles:	Cts ₩ ℔
3 in. x ¼ in. and larger	2.15¢
3 in. x 3-16 in. and ⅛ in	2.25¢
1¼ to 2½ in. x ⅛ in	2.05¢
1¼ to 2½ in. x 3-16 in and thicker	2.00¢
1 to 1¼ in. x 3-16 in	2.05¢
1 to 1¼ x ⅛ in	2.10¢
⅞ x ¼ in	2.25¢
¾ x ¼ in	2.35¢
⅝ x ¼ in	3.15¢
½ x ¼ in	3.65¢
Tees:	
1 in	2.45¢
1¼ in	2.25¢
1½ to 2½ in	2.15¢
3 in. and larger	2.40¢
Beams	2.35¢
Channels, 3 in. and larger	2.35¢
Bands—1½ to 6 x 3-16 to No. 8, ₩ ℔	2.10¢
"Burden's Best" Iron, base price, ₩ ℔	3.05¢
Burden's "H. B. & S. Iron, base price, ₩ ℔	2.85¢
"Ulster" ₩ ℔	3.10¢
Norway Bars	3.25@3.75¢
Norway Shapes	3.75@4.25¢

Merchant Steel from Store—

	per ℔
Bessemer Machinery	1.85¢
Toe Calk, Tire and Sleigh Shoe	2.00@2.50¢
Best Cast Steel, base price in small lots	7¢

Soft Steel Sheets—

¼ inch	2.30¢	No. 14	2.45¢
5-16 inch	2.30¢	No. 16	2.55¢
No. 8	2.30¢	No. 18	2.65¢
No. 10	2.35¢	No. 20	2.65¢
No. 12	2.40¢	No. 22	2.70¢

Sheet Iron from Store.

Black.

	One Pass, C. R. Soft Steel	R. G. Cleaned.
No. 14	₩ ℔ 2.35	2.50¢
No. 16	₩ ℔ 2.45	2.60¢
Nos. 18 to 21	₩ ℔ 2.55	2.70¢
Nos. 22 to 24	₩ ℔ 2.60	2.80¢
Nos. 25 and 26	₩ ℔ 2.65	2.90¢
No. 27	₩ ℔ 2.70	3.00¢
No. 28	₩ ℔ 2.80	3.10¢

Russia, Planished, &c.

Genuine Russia, according to assortment, ₩ ℔	11¾@14¢
Patent Planished, ₩ ℔ A, 10¢; B, 9¢, net.	

Galvanized.

Nos. 14 to 16, ₩ ℔	2.85¢
Nos. 18 to 20, ₩ ℔	3.00¢
Nos. 22 to 24, ₩ ℔	3.33¢
No. 26, ₩ ℔	3.56¢
No. 27, ₩ ℔	3.80¢
No. 28, ₩ ℔	4.04¢
No 30, ₩ ℔	4.99¢

No. 20 and lighter, 36 inches wide, 25¢ higher.

Foreign Steel from Store—

Best Cast, ₩ ℔	15 ¢
Extra Cast, ₩ ℔	18 @ 20 ¢
Swaged, Cast, ₩ ℔	16 ¢
Best Double Shear, ₩ ℔	15 ¢
Blister, 1st quality, ₩ ℔	13 ¢
German Steel, Best, ₩ ℔	10 ¢
2d quality, ₩ ℔	9 ¢
3d quality, ₩ ℔	8 ¢
Sheet Cast Steel, 1st quality, ₩ ℔	15 ¢
2d quality, ₩ ℔	14 ¢
3d quality, ₩ ℔	12 ¢
R. Mushet's "Special" ₩ ℔	46 ¢
" " "Titanic" ₩ ℔	19 ¢
Hobson's Choice XX Extra Best, ₩ ℔	85 ¢
Jessop Self Hardening, ₩ ℔	45 ¢
Seamans' "Nelson" Steel	40 ¢
Hobson's "Soho" Special Self-Hardening, ₩ ℔	43 ¢

METALS—

Tin—

Duty.—Pigs, Bars and Block. Free.	Per ℔
Banca, Pigs	29½@30 ¢
Straits, Pigs	29½@30 ¢
Straits in Bars	30 @31 ¢

Tin Plates—

American Charcoal Plates.

Calland Grade:	
IC, 14 x 20	$6.35
IX, 14 x 20	7.85
Melyn Grade:	
IC, 14 x 20	6.10
IX, 14 x 20	7.35
Allaway Grade:	
IC, 14 x 20	5.10
IX, 14 x 20	6.20

American Coke Plates—Bessemer—

IC, 14 x 20 ..... 108 ℔	$4.25
IX, 14 x 20	$5.25

American Terne Plates—

IC, 20 x 28	$8.30
IX, 20 x 28	$10.30

Copper—

DUTY: Pig, Bar and Ingot and Old Copper free. Manufactured, 2½¢ ₩ lb.

Ingot—

Lake	13¼@13⅜¢
Casting	13¼@13⅜¢

Sheet and Bolt—

October 22, 1903. Net

Prices, in cents per pound.

Sheet 30 x 60.

Not wider than	Not longer than	And longer than	64 oz. & over, 50th. sheet, 30 x 60 and heavier.	56 oz. to 64 oz., 25 to 30 lb.	24 oz., to 28 oz., 18¾ to 25 lb.	16 oz. to 24 oz., 12½ to 18¾ lb.	14 oz. and 15 oz., 11 to 12½ lb.	13 oz. and 13 oz., 9¾ to 11 lb.	10 oz. and 12 oz., 7¾ to 9½ lb.	8 oz. and 9 oz., 6¼ to 7¾ lb.	Lighter than 8 oz.
Ins.	Ins.	Ins.									
30	72	.....	18	19	19	19	20	21	22	23	28
30	96	72	18	19	19	19	20	22	25	28	
30	.....	96	18	19	19	19	21	25			
36	72	.....	18	19	19	19	21	23	26	29	
36	96	72	18	19	19	19	21	25	28		
36	120	96	18	19	19	20	22				
36	.....	120	18	19	19	21					
48	72	.....	18	19	18	21	23	26	29		
48	96	72	18	19	18	22	24	27			
48	120	96	18	19	21	23	27				
48	.....	120	18	20	22	25					
60	72	.....	19	19	20	22	25	30			
60	96	72	18	19	21	23	28				
60	120	96	18	20	22	25					
60	.....	120	18	21	23	27					
72	96	.....	18	22	22	27					
72	120	96	18	21	24	29					
72	.....	120	19	22	27						
108	96	.....	19	22	25						
108	120	96	20	23	26						
108	.....	120	21	24	28						
wider than 108	132	.....	22	25							
	.....	132	23	24							

Circles, Segments and Pattern Sheets, 3¢ ₩ ℔ advance over price of sheet Copper required to cut them from.

Cold or Hard Rolled Copper, 14 oz. ₩ square foot and heavier, 1¢ ₩ ℔ over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 oz. ₩ square foot, 2¢ ₩ ℔ over the foregoing prices.

All Polished Copper, 20 in. wide and under, 1¢ ₩ ℔ advance over the price for Cold Rolled Copper.

All Polished Copper, over 20 in. wide, 2¢ ₩ ℔ advance over the price for Cold Rolled Copper.

Planished Copper—

1¢ ₩ ℔ more than Polished Copper.

Copper Bottoms, Pits and Flats—

14 oz. to square foot and heavier, ₩ ℔	23¢
12 oz. and up to 14 oz. to square foot, ₩ ℔	24¢
10 oz. and up to 12 oz., ₩ ℔	26¢
Lighter than 10 oz., ₩ ℔	29¢

Circles less than 8 in. diameter, 2¢ ₩ ℔ additional

Circles over 13 in. diameter are not classed as Copper Bottoms.

Polished Copper Bottoms and Flats, 1¢ ₩ ℔ extra.

Copper Wire—

Hard and Soft Drawn—B. & S. Gauge.

List Feb. 23, 1901.

Nos.	0000 to 5	9 and 10	11 and 12
	Base	¼¢	¾¢ ₩ ℔ adv.
Nos.	13	14	15 16
	¼¢	½¢	¼¢ ₩ ℔ adv.
Nos.	17	18	19 20
	1¼¢	2¢	2½¢ ₩ ℔ adv.

Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.

Feb. 19, 1904. Net. Outside Diameter.

Stubs' W.G.	B. & S. W.G.	¼	9-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½
4-11	9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18	18
12	10	.....	.....	.....	.....	.....	.....	24	24	23	23	18	18
13	11	.....	.....	.....	.....	.....	.....	25	25	23	23	18	18
14	12	.....	.....	.....	.....	25	25	25	23	23	23	19	19
15	13	.....	.....	.....	26	25	25	25	23	23	23	19	19
16	14	.....	.....	26	26	25	25	25	23	23	23	20	20
17	15	.....	29	26	26	25	25	25	23	23	23	21	21
18	16	49	31	27	27	26	26	26	24	24	24	22	22
19	17	58	31	27	27	26	26	26	24	24	24	23	23
20	18-19	60	31	27	27	26	26	26	24	24	24	24	24
21	20	62	47	29	28	28	26	25	25	25	25	25	25
22	21	67	52	31	31	29	29	27	26	26	26	26	26
23	22	72	57	33	33	31	31	29	29	29	29	29	29
24	23	77	62	49	44	42	41	40	39	37	36	36	37
25	24	82	67	52	47	45	43	42	41	40	40	41	42

Copper Bronze and Gilding Tube, 3¢ ₩ ℔ additional

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
36	30	29	27	21	21	21	21	21	21	21	23	23	25	27	28¢ ₩ ℔

Copper, Bronze or Gilding Tubes, 3¢ ₩ ℔ additional

Brazed Brass Tubing.

(*To No. 19, inclusive.*) June 6, 1898.

Brown & Sharpe's gauge standard.

	Per ℔.
Plain Round Tube, ¼ in. up to 2 in.	$0.35
" " ⅜ " " ¾ "	.36
" " ½ " " ¾ "	.38
" " ⅝ " " ¾ "	.41
" " ¾ " " ¾ "	.48
" " 5-16 " " ¾ "	.48
" " ¼ " 5-16"	.65
" " 3-16 " ¼"	1.00
" " ¼ " 3-16"	1.50
Smaller than ¼ inch	Special
2 inch to 3 inch, to No. 19, inclusive	.38
3 inch	.40
Over 3 inch to 3½ inch, inclusive	.45
Over 3½ inch	.50

Bronze and Copper, advance on Brass List, 3 cents.

Discount from list 5 ..... 25%

Roll and Sheet Brass—

(*Brown & Sharpe Standard Gauge.*)

Common High Brass.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Wider than and including	2 12	12 14	14 16	16 18	18 20	20 22	22 24	24 26	
To No. 20 inclusive	.22	.23	.25	.27	.29	.31	.33	.36	
Nos. 21, 22, 23 and 24	.23	.24	.26	.28	.30	.32	.34	.37	
Nos. 25 and 26	.23	.24½	.27	.29	.31	.33	.35	.38	
Nos. 27 and 28	.25	.25	.25	.30	.32	.34	.36	.39	

Common High Brass.	in.	in.	in.	in.	in.	in.	in.	in.
Wider than and including	26 28	28 30	30 32	32 34	34 36	36 38	38 40	
To No. 20, inclusive	.39	.42	.46	.50	.55	.60	.65	*
Nos. 21, 22, 23 and 24	.40	.43	.47	.51	.56	.61	.68	
Nos. 25 and 26	.41	.44	.48	.52	.57	.63	.71	
Nos. 27 and 28	.42	.45	.49	.53	.58	.65	.75	

* Special prices not less than 80 cents.

Add ¼¢ ₩ ℔ additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List..... 25%

Wire in Coils. List February 26, 1896.

Brown & Sharpe's gauge the standard.	Com. high brass.	Low brass.	Gild'g bronze and copper
All Nos. to No. 10, inclusive	$0.23	$0.27	$0.28
Above No. 10 to No. 16	.23¼	.27¼	.28¼
No. 17 and No. 18	.24	.28	.32
No. 19 and No. 20	.25	.29	.33
No. 21	.26	.30	.34
No 22	.27	.31	.35
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.42	.46	.51
No. 29	.45	.49	.54
No. 30	.48	.52	.62
No. 31	.51	.55	.67
No. 32	.55	.59	.73
No. 33	.59	.63	.82
No. 34	.64	.68	.95
No. 35	.70	.74	1.30
No. 36	.76	.80	1.50
No. 37	1.00	1.04	1.70
No. 38	1.30	1.34	2.00
No. 39	2.00	2.00	3.25
No. 40	2.60	2.60	5.75

Discount, Brass Wire, 25%; Copper Wire, NET.

List November 16, 98.

Spring Wire, 2¢ ₩ ℔ advance.

Tobin Bronze—

Straight, but not turned, Rods, ⅜ to 3 in. diameter, ₩ ℔ net	18¢
Finished Piston Rods, ⅜ to 2½ in. diameter, ₩ ℔ net	19¢

Other sizes and extreme lengths, special prices.

Spelter—

Duty: In Blocks or Pigs, 1¢ ₩ ℔

Western Spelter	5¼@5¾¢

Zinc.

Duty: Sheet, 2¢ ₩ ℔.

No. 9, base, casks	6¾¢	Open per, ℔	7¼¢

Lead.

Duty: Pigs and Bars and Old, 2½¢ ₩ ℔. Pipe and Sheets, 2¾¢ ₩ ℔.

American Pig	5@5¼¢
Bar	5¼@6¢
Pipe, ₩ ℔	5@5¼¢
Tin Lined Pipe, ₩ ℔	12¢
Block Tin Pipe, ₩ ℔	40 ¢
Sheet Lead, ₩ ℔	5¼@6 ¢

Old Lead in exchange, 3½¢ ₩ ℔

Solder.

¼ & ⅛, guaranteed	18¼@19¼¢
No. 1	16¼@17¼¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Duty, ¾¢ ₩ lb.

Cookson, ₩ ℔	8¼@8¾¢
U. S.	6¼@6¾¢
Hungarian	6¾@6.75¢

Aluminum—

Duty: Crude, 8¢ ₩ ℔. Plates, Sheets, Bars and Rods, 13¢ ₩ ℔.

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:	
Small lots, ₩ ℔	37¢
100-℔ lots, ₩ ℔	35¢
No. 2 Aluminum (guaranteed to be over 90% pure), in ingots for remelting:	
Small lots, ₩ ℔	34¢
100-℔ lots, ₩ ℔	33¢

Aluminum Sheet, B. & S. Gauge. 50 ℔ or more

Wider than	6-in.	14-in.	24-in.
And including	14-in.	24-in.	30-in.
	₩ ℔.	₩ ℔.	₩ ℔
Nos. 13 to 19	$0.42	$0.44	$0.47
No. 20	.44	.46	.49
Nos. 21 to 23	.46	.48	.51
No. 24	.46	.50	.53
No. 25	.47	.51	.54
No. 26	.47	.54	.59
No. 27	.48	.57	.62
No. 28	.48	.57	.64
No. 29	.49	.60	.69
No. 30	.50	.64	.77

Note.—Lots of less than 50 ℔ 5¢ ₩ ℔ extra.

Aluminum Wire, B. & S. Gauge.

Larger than No. 9, ₩ ℔	40¢	No. 15, ₩ ℔	43¢
No. 9 to No. 10, ₩ ℔	40½¢	No. 17, ₩ ℔	50¢
No. 11, ₩ ℔	41 ¢	No. 18, ₩ ℔	55¢
No. 12, ₩ ℔	41½¢	No. 19, ₩ ℔	60¢
No. 13, ₩ ℔	42 ¢	No. 20, ₩ ℔	65¢
No. 14, ₩ ℔	42½¢	No. 21, ₩ ℔	85¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper, ₩ ℔	10½¢
Light and Tinned Copper, ₩ ℔	10 ¢
Heavy Brass, ₩ ℔	7½¢
Light Brass, ₩ ℔	5½¢
Lead, ₩ ℔	4½¢
Tea Lead, ₩ ℔	3½¢
Zinc, ₩ ℔	3½¢
No. 1 Pewter, ₩ ℔	17 ¢
No. 2 Pewter, ₩ ℔	8 ¢
Pure Aluminum, Sheet, ₩ ℔	21¢
Cast Aluminum, ₩ ℔	16¢
Tin Plate Scrap, ₩ ton	$4.50@5.50
Wrought Scrap Iron, ₩ gross ton	$12.00@12.50
Heavy Cast Scrap, ₩ gross ton	$11.00@11.50
Stove Plate Scrap, ₩ gross ton	$8.50@ 9.00
Burnt Iron, ₩ gross ton	$5.50@ 6.00

LB O '04

VOLUME

TIGHTLY BOUND

BEST COPY

AVAILABLE